Syllabus

International Master's Degree Program (2017-Fall Term)

(M40030040)Culture and Communication II[Culture and Communication II]

Subject name[English]	Culture and Comr	nunication II[Culture	and Communicati	on II]		
Schedule number	M40030040	Subject area	General	Required or	Elective	
			courses	elective		
Time of starting a course	Fall term	Dav of the	Thu.1~1	Credit(s)	2	
		week.period			_	
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	1~	
Department Offered	Mechanical Eng	ineering, Architec	ture and Civil	Beggining grade	M1	
-	Engineering, Elec	ctrical and Electr	onic Information			
	Engineering, Cor	nputer Science a	and Engineering,			
	Environmental and	d Life Sciences				
Charge teacher name[Roman	加藤 三保子 KAT	TOH Mihoko				
alphabet mark]						
Numbering	GEN_LIB51025					
Objectives of class						
The primary purposes of this class	s are:					
(1) To encourage students to exp	ress their views on	Japanese culture a	nd society.			
(2) To raise the student's awarene	ess of his/her own i	indigenous culture.				
(3) To disseminate information ab	out his/her culture.					
Contents of class						
Students will be offered an overvi	ew of contemporary	v Japanese culture				
Students will read and discuss the	epics as follows	,				
Wask 1. Jakes duration A. L.	ad #ba!					
Week 1: Introduction, Ambiguity an	na the Japanese					
Week 2: The Concept of Japanese	Dependence					
Week 3: The Way of the Warrior						
Week 4: Silence in Japanese Com	munication					
Week 5: Male and Female Relation	iships in Japan					
Week 6: Japanese Patience and D	etermination					
Week 7: Japanese Social Obligatio	ons					
Week 8: An Implicit Way of Comm	unication in Japan					
Week 9: Adopting Elements of For	eign Culture					
Week 10: The Japanese Virtue of	Modesty					
Week 11: The Japanese Sense of	Beauty					
Week 12: Japanese Group Consci	ousness					
Week 13: Presentation & discussion	on					
Week 14: Presentation & discussion	on					
Week 15: Presentation & discussion	on					
During the term, students will cho	oose a specific cult	tural issue to resea	rch and give a sho	rt oral presentation	n, exchange ideas	
about their research. At the end	of the term, studen	ts are required to s	ubmit a summary o	f his/her presentat	ion.	
Self Preparation and Review						
This course requires students pro	per preparation bef	ore each class. Par	ticipation is crucia	l.		
Related subjects						
Notes for textbook						
No textbook is required for this co	ourse. All material w	vill be provided.				
Notes for reference						
Goals to be achieved						
(1) To understand Japanese Cultu	ire and Society					
 (2) Enhance student's awareness of his/her own culture and society, and improve their ability to disseminate information about 						
it to people from other cultures				,		
Evaluation of achievement						
In-class work 20% Oral presentation	ion 50% Written ren	ort (summary of pre	sentation) 30%			
		ore (summary or pre				
Englander 1911						
Final grades will be given on an ab	solute scale:					
80% or above: A						
65% or above: B						
טלט or above: C						

Examination 試験期間中には何も行わない None during exam period Details of examination By individual presentation and report (summary of presentation) Other information Office: B-511 Phone (ext): 6959 E-mail: mihoko@las.tut.ac.jp Reference URL Office hours Tuesdays 13:00-14:00 Thursdays 13:00-14:00 Relations to attainment objectives of learning and education ○社会基盤⊐ース Key words culture, communication

(M40030090)Principles o	f Japanese	Grammar[Princip	oles of J	Japanese Gi	rammar]
-------------------------	------------	-----------------	-----------	-------------	---------

(M40030090)Principles of	f Japanese Grammar[Principles	of Japanese Gram	mar]		
Subject name[English]	Principles of Japanese Gramm	nar[Principles of Ja	panese Grammar]		
Schedule number	M40030090	Subject area	General courses	Required or elective	Elective
Time of starting a course	Fall term	Day of the week,period	Thu.1~1	Credit(s)	2
Faculty	Graduate Program for Master'	s Degree		Subject grade	1~
Department Offered	Mechanical Engineering, Ar	rchitecture and	Civil Engineering,	Beggining	M1
	Electrical and Electronic	Information Engir	neering, Computer	grade	
Charma tasahar	Science and Engineering, Envir	ronmental and Life	Sciences		
name[Roman alphabet					
mark]					
Numbering	GEN_LIB54025				
Objectives of class					
This course aims to provi	ide an opportunity to understand	d an overview of el	ementary Japanese g	grammar for the	very beginners.
In order to concentrate	on grammar, students will not le	earn Japanese lett	ers and conversation	n. The course w	ill be taught in
English, and progress rap	idly.				
Ontents of class	to the course and reneval feature	rad of Jananaaa			
01 (10/05) Introduction	to the course and general leatur	res of Japanese			
02 (10/12) Pronunciation	n, Lesson 1: Copula, Particle ″wa	a″ [topic], and Dec	larative, negative, an	d interrogative s	entence
03 (10/19) Lesson 2 and	3: Demonstratives and Particle	no" [possession]	l		
04 (11/02) Lesson 4 a	ind 5: Verbs Tense (non-nast	and nast) Partic	le "ni" [time] "kar	ra [start] "mad	ه" [roal] "ه"
[direction] "de" [transpo	ind J. Verbs, Tense (non-past	. anu past/, Fartio	sie ni Luinej, kar	a [start], mau	ie [goai], e
05 (11/09) Lesson 6 and	l 7; Particle ″o″ [object], ″de″ [j	place][means], ″ni′	´[goal][source]		
06 (11/16) Lesson 8: Ad	jectives, Lesson 9: Particle ″ga″	[object]			
07 (11/30) Lesson 10: E	xistence, Lesson 11: Numerals a	and Counter suffixe	S		
08 (12/07) Lesson 12: P	ast tense of adjectives, Lesson	13: Adjectives of D)esire		
09 (12/14) Lesson 14 ar	nd 15: Verb groups, "te"-form of	f verbs, and Senter	nces using "te"-form		
10 (01/11) Lesson 16: S	entences using "te"-form, Less	on 17: ″nai″-form	of verbs		
11 (01/18) Lesson 18: D	ictionary form of verbs, Lesson	19: "ta"-form of v	erbs		
12 (01/25) Lesson 20: P	olite and plain style, Lesson 21:	Indirect speech			
13 (02/01) Lesson 22: N	oun modification				
14 (02/08) Lesson 23: C	complex sentence using "toki", L	esson 25: Subjunc	tive mood		
15 (02/15) Lesson 24: E	xchanging things or kindness				
16 (03/01) Final exam					
Self Preparation and Rev	riew				
Read the respective part	s of the textbook in advance.				
Memorize the sentences	learned in every class meeting t	o prepare for the r	next class's quiz.		

Relact adapted: Non-credit course "Basic Gammas" of the course, students will leam Exercise A and B. In the class "Basic Grammar" of the course, students will be taught Exercise C and Conversation. For more information, contract International Maria Division. Text block1 Book title Minna no Nihongo (Elementary, Japanese I, 2nd) BBN 875-4- 88319-629-6 Author Publisher 3A Corporation Publish year 2013 Notes for taxbook Author Publisher 3A Corporation Publish year 2013 Notes for taxbook Each leason consists of Tylocabulary, 2hranslation of the main textbook. 3Juseful words and information, and 4Jgrammar notes. 1/Yocabulary and 4Jgrammar notes. 1/Yocabulary and 4Jgrammar notes. 1/Yocabulary. 1/Yocabulary. <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th></td<>								
Non-credit course "Basic Japanese" will cover the main textbook: In the class "Basic Conversation" of the course, students will be Exercise C and Conversation. For more information, contact International Affairs Division. TextbookI Bok title Minna on Nihongo (Elementary Japanese I, 2nd ISBN 978-4- Basic Conversation" of the course, students will be taught Exercise C and Conversation. For more information, contact International Affairs Division TextbookI Bok title Minna on Nihongo (Elementary Japanese I, 2nd ISBN 978-4- Basic Meson consists of 11vocabulary, 2)translation of the main textbook, 3Juseful words and information, and 4)grammar notes. Notes for textbook Robes for reforence Coals to be achieved At the end of this course students will be taught in the course. Notes for reforence Coals to be achieved At the end of this course students will be able 1) to now pronunciation of Japanese language. 2) to understand pronunciation and meaning of elementary Japanese vocabulary. 3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy: Quizes 30%. Final exam 70% A The total score is botween 65 and 79.90. C: The total score is botween 65 and 79.90. Examination (Face to Face) Details of examination Cher information Grading Policy: Quizes 30%. Final exam 70% A The total score is botween 65 and 79.90. Examination (Face to Face) Details of examination Cher information Cher information Grade Policy: Reference URL Coffice hours Office hours Office hours Pride 11:00-12:00 By appointment 08:30-12:00, 13:00-16:30 on weekday will be available. Relations to atlainment objectives of learning and education Key words elementary Japanese, grammar	Related subjects							
In the class "Basic Grammar" of the course, students will be taught Exercise C and Conversation. For more information, contact International Affairs Division. TextbookI Book title Affairs Division. TextbookI Book title Affairs Division. Textbook Book title Affairs Division. Textbook Clementary Japanese I, 2nd SBN 8319-629-6 Author Publisher 3A Corporation Publish year 2013 Notes for textbook Each lesson consists of 1/locabulary. 2)translation of the main textbook, 3)useful words and information, and 4)grammar notes. Notes for reference Coals to be achieved At the end of this course students will be taught in the course. Notes for reference Coals to be achieved At the end of this course students will be able 1) to know pronunciation and meaning of elementary Japanese vocabulary. 3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy: Quizes 30%, Final exam 70% A. The total score is between 65 and 79.99. C: The total score is between 65 and 79.99. C: The total score is between 65 and 64.99. Examination(Face to Face) Details of examination Reference URL Office hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar.	Non-credit course "Bas	sic Japanese″ wi	Il cover the main	textbook:				
In the class "Basic Conversation" of the course, students will be taught Exercise C and Conversation. For more information, contact. International Affairs Division. TextbookI Book title Minna on Nihongo (Elementary Japanese 1, 2nd ISBN 978-4- 88319-629-6 Author Publisher 3A Corporation Publish year 2013 Notes for textbook Each lesson consists of 11vocabulary. 2)translation of the main textbook. 3)useful words and information, and 4)grammar notes. Notes for textbook Author I Publisher 3A Corporation Publish year 2013 Notes for retextbook Author I Publisher 3A Corporation Publish year 2013 Notes for retextbook Author I Publisher 3A Corporation Publish year 2013 Notes for retextbook Author and Migrammar notes only will be taught in the course. Notes for reference Goals to be achieved At the end of this course students will be able 1) to know pronunciation of Japanese Inguage. 2) to understand pronunciation and meaning of elementary Japanese vocabulary. 3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy: Quizes 300, Final exam 705 A: The total acore is B0 or more. B: The total acore is B0 armore. B: The total a	In the class "Basic Gran	mmar" of the co	urse, students wil	II learn Exercise	A and B.			
For more information, contact. International Affairs Division. Textbook1 Book title Minna no. Nihongo (Elementary Japanese I, 2nd ISBN 978-4	In the class "Basic Con	versation" of the	e course, student	s will be taught E	Exercise C and Convers	sation.		
Textbook1 Book title Minna no Nhongo (Elementary Japanese I, 2nd Edition) Translation & Grammar Notes-English, Author ISBN 978-4- 88319-629-6 Notes for textbook Each lesson consists of 1)/vocabulary, 2)/translation of the main textbook, 3)/useful words and information, and 4)grammar notes. 10/bocabulary and 4)grammar notes only will be taught in the course. Publisher 3A Corporation Publish year 2013 Notes for reference Coals to be achieved Notes for reference 2013 Coals to be achieved At the end of this course students will be able 1) to know pronunciation of Japanese language. 2) to understand pronunciation and meaning of elementary Japanese vocabulary. 3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Crading Policy: Quizes 30%, Final exam 70% A: The total score is between 65 and 64.99. Examination(Face to Face) Examination(Face to Face) Evaluation of station of used and information Examination(Face to Face) Datais of examination Evaluation of supervise of learning and education Chick Information Evaluation of use of taxing and education Evaluation of achievement Evaluation (Face to Face) Datais of examination Evaluation of use of taxing and education Evaluation (Face to Face)	For more information, co	ontact Internatio	nal Affairs Divisio	on.				
Edition Translation & Grammar Notes-English, Romanized Version B8319-629-6 Author Publisher 3A. Corporation Publish year 2013 Notes for textbook Each lesson consists of 1/vocabulary, 2/translation of the main textbook, 3/useful words and information, and 4/grammar notes. Notes for reference Vocabulary and 4/grammar notes only will be taught in the course. Notes for reference Vocabulary and 4/grammar notes. Vocabulary and and and and and and and and and ano and ano ano and ano and ano ano ano ano and ano and ano ano ano	Textbook1	Book title	Minna no Nih	nongo (Elementa	ry Japanese I, 2nd	ISBN	978-4-	
Author Publisher 3A Corporation Publish year 2013 Notes for textbook Each lesson consists of 1/vocabulary, 2/translation of the main textbook, 3/useful words and information, and 4/grammar notes. 1/Vocabulary and 4/grammar notes. 1/Vocabulary and 4/grammar notes. 1/Vocabulary and 4/grammar notes. Notes for reference Each lesson consists of 1/vocabulary, 2/translation of the main textbook, 3/useful words and information, and 4/grammar notes. 1/Vocabulary and 4/grammar notes. Notes for reference Each lesson consists of 1/vocabulary, 2/translation of the main textbook, 3/useful words and information, and 4/grammar notes. 1/Vocabulary and 4/grammar notes. Notes for reference Each lesson consists of 1/vocabulary, 2/translation of the main textbook, 3/useful words and information, and 4/grammar notes. 1/Vocabulary and 4/grammar notes. 10 to know pronunciation of Japanese language. 1/Vocabulary and pronunciation and meaning of elementary Japanese vocabulary. 1/Vocabulary. 1/Vocabulary. 2) to understand pronunciation and meaning of elementary Japanese vocabulary. 1/Vocabulary. 1/Vocabulary. 1/Vocabulary. 2) to grasp an overview of elementary Japanese grammar. Evaluation of ablevement 1/Vocabulary. 1/Vocabulary. 1/Vocabulary. 2/Vocabulary. 1/Vocabulary. 1/Vocabulary. <			Edition) Tran	slation & Gran	nmar Notes-English,		88319-629-6	
Author Publisher 3A. Corporation Publish year 2013 Notes for taxtbook Each lesson consists of 1/bocabulary, 2/translation of the main textbook, 3)useful words and information, and 4)grammar notes. 1/Vocabulary and 4)grammar notes only will be taught in the course. I/Vocabulary and 4)grammar notes only will be taught in the course. Notes for reference Coals to be achieved I/Vocabulary and 4)grammar notes only will be aught in the course. I/Vocabulary and 4)grammar notes. At the end of this course students will be able 1) to know pronunciation of Japanese language. I/Vocabulary. I/Vocabulary. 3) to graps an overview of elementary Japanese grammar. I/Vocabulary. I/Vocabulary. I/Vocabulary. S) to graps an overview of elementary Japanese grammar. I/Vocabulary. I/Vocabulary. I/Vocabulary. S) to graps an overview of elementary Japanese grammar. I/Vocabulary. I/Vocabulary. I/Vocabulary. S) to graps an overview of elementary Japanese grammar. I/Vocabulary. I/Vocabulary. I/Vocabulary. Evaluation of achievement I/Vocabulary. I/Vocabulary. I/Vocabulary. I/Vocabulary. C) The total score is between 65 and 79.90. I/Vocabulary. I/Vocabulary. I/Vocabula			Romanized Ve	rsion				
Notes for textbook Each lesson consists of 1/Nocabulary. 2)translation of the main textbook. 3)useful words and information, and 4)grammar notes. Notes for reference Goals to be achieved At the end of this course students will be able 1) to know pronunciation of Japanese language. 2) to understand pronunciation and meaning of elementary Japanese vocabulary. 3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy. Quizes 30%, Final exam 70% A: The total score is 80 or more. B: The total score is between 65 and 79.99. C: The total score is between 55 and 64.99. Examination z # addity		Author		Publisher	3A Corporation	Publish year	2013	
Total texture Total consists of 1)vocabulary, 2)translation of the main textbook, 3)useful words and information, and 4)grammar notes. Notes for reference Coals to be achieved At the end of this course students will be able 1) to know pronunciation of Japanese language. 2) to understand pronunciation and meaning of elementary Japanese vocabulary. 3) to graps an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy: Quizes 30%, Final exam 70% A: The total score is 80 or more. B: The total score is between 65 and 79.99. C: The total score is between 55 and 64.99. Examination Examination (Face to Face) Details of examination Office hours Offi	Notes for textbook					-		
Leach resson contracts on tyrocaculary. An analosis of the main textbook, prosend white and information, and Arganiman notes. 1/Vocabulary and Agrammar notes only will be taught in the course. Notes for reference Goals to be achieved At the end of this course students will be able 1 to know pronunciation of Japanese language. 2) to understand pronunciation and meaning of elementary Japanese vocabulary. 3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy: Quizes 30%, Final exam 70% A: The total score is 80 or more. B: The total score is between 65 and 79.99. C: The total score is between 65 and 64.99. Examination 定期試験を実施(対面) Examination Cher information Other information Other information Other information Reference URL Office hours Office hours Office hours Office hours Collections to attainment objectives of learning and education Key words elementary Japanese, grammar	Fach lesson consists of	1)vocabulary 2	translation of the	main taxthook	3)useful words and inf	ormation and ()	grammar notac	
Invocabulary and Agrammar notes only will be taught in the course. Notes for reference Goals to be achieved At the end of this course students will be able 1) to know pronunciation and meaning of elementary Japanese vocabulary. 2) to understand pronunciation and meaning of elementary Japanese vocabulary. 3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy: Quizes 30%, Final exam 70% A: The total score is 80 or more. B: The total score is between 65 and 70.99. C: The total score is between 55 and 64.99. Examination Zyllatike statiscom Zyllatike statiscom Zyllatike statiscom Details of examination Other information Reference URL Office hours Office hour Office hour Office hour Office to attainment objectives of learning and education Key words elementary Japanese, grammar					3)userui worus anu init	ormation, and 4)	grammar notes.	
Notes for reference Goals to be schieved At the end of this course students will be able 1) to know pronunciation of Japanese language. 2) to understand pronunciation and meaning of elementary Japanese vocabulary. 3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy: Quizes 30%, Final exam 70% A: The total score is 80 or more. B: The total score is between 65 and 79.99. C: The total score is between 55 and 64.99. Examination 定期關後支援(対面) Examination(Face to Face) Details of examination Other information Reference URL Office hour Friday 11:00-12:00 By appointment 0bjectives of learning and education Key words elementary Japanese, grammar	1)vocabulary and 4)gran	nmar notes only	will be taught in t	the course.				
Notes for reference Goals to be achieved At the end of this course students will be able 1) to know pronunciation of Japanese language. 2) to understand pronunciation and meaning of elementary Japanese vocabulary. 3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy: Quizes 30%, Final exam 70% A: The total score is between 65 and 79.99. C: The total score is between 65 and 64.99. Examination 定期試験を実施 (対面) Examination(Face to Face) Details of examination Other information Reference URL Office Hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar								
Goals to be schieved At the end of this course students will be able 1) to know pronunciation of Japanese language. 2) to understand pronunciation and meaning of elementary Japanese vocabulary. 3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy: Quizes 30%, Final exam 70% A: The total score is 80 or more. B: The total score is between 65 and 79.99. C: The total score is between 55 and 64.99. Examination 定期alliseを実施(対面) Examination floate to Face() Details of examination Other information Reference URL Office hours Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	Notes for reference							
Goals to be achieved At the end of this course students will be able 1) to know pronunciation of Japanese language. 2) to understand pronunciation and meaning of elementary Japanese vocabulary. 3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy: Quizes 30%, Final exam 70% A: The total score is 80 or more. B: The total score is between 65 and 79.99. C: The total score is between 55 and 64.99. Examination 定期膨脹を実施(対面) Examination(Face to Face) Details of examination Other information Reference URL Office hours Office Hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar								
At the end of this course students will be able 1) to know pronunciation of Japanese language. 2) to understand pronunciation and meaning of elementary Japanese vocabulary. 3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy: Quizes 30%, Final exam 70% A: The total score is 80 or more. B: The total score is between 65 and 64.99. Examination Examination Examination(Face to Face) Details of examination Other information Reference URL Office hour Friday 11:00–12:00 By appointment 08:30–12:00, 13:30–16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	Goals to be achieved							
1) to know pronunciation of Japanese language. 2) to understand pronunciation and meaning of elementary Japanese vocabulary. 3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy: Quizes 30%, Final exam 70% A: The total score is 80 or more. B: The total score is 80 or more. B: The total score is between 65 and 79.99. C: The total score is between 55 and 64.99. Examination 定期試験を実施(対面) Examination(Face to Face) Details of examination Other information Reference URL Office hours Office hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	At the end of this cours	se students will b	oe able					
2) to understand pronunciation and meaning of elementary Japanese vocabulary. 3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy: Quizes 30%, Final exam 70% A: The total score is 80 or more. B: The total score is 80 or more. C: The total score is between 65 and 79.99. C: The total score is between 55 and 64.99. Examination graphity Examination Cther information Other information Reference URL Office hour Grifice hour Grifice hour Grifice hour Grifice hour H: 100-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	1) to know pronunciation	n of Japanese la	nguage.					
3) to grasp an overview of elementary Japanese grammar. Evaluation of achievement Grading Policy: Quizes 30%, Final exam 70% A: The total score is 80 or more. B: The total score is between 65 and 79.99. C: The total score is between 55 and 64.99. Examination Examination Examination (Face to Face) Details of examination Other information Reference URL Office hours Office Hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	2) to understand pronun	nciation and mea	ning of elementar	y Japanese voca	bulary.			
Evaluation of achievement Grading Policy: Quizes 30%, Final exam 70% A: The total score is 80 or more. B: The total score is between 65 and 79.99. C: The total score is between 55 and 64.99. Examination 定期試験を実施(対面) Examination(Face to Face) Details of examination Other information Reference URL Office hours Office hour Friday 11.00–12:00 By appointment 08:30–12:00, 13:30–16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	3) to grasp an overview	of elementary J	apanese grammar	.				
Evaluation of achievement Grading Policy: Quizes 30%, Final exam 70% A: The total score is 80 or more. B: The total score is between 65 and 79.99. C: The total score is between 55 and 64.99. Examination 定期試験を実施(対面) Examination(Face to Face) Details of examination Other information Reference URL Office hours Office Hour Friday 11:00-12:00 By appointment 08:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar								
Grading Policy: Quizes 30%, Final exam 70% A: The total score is 80 or more. B: The total score is between 65 and 79.99. C: The total score is between 55 and 64.99. Examination 定期試験を実施(対面) Examination(Face to Face) Details of examination Other information Reference URL Office hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	Evaluation of achieveme	ent						
A: The total score is 80 or more. B: The total score is between 65 and 79.99. C: The total score is between 55 and 64.99. Examination 定期試験を実施(対面) Examination(Face to Face) Details of examination Other information Reference URL Office hours Office hours Office Hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	Grading Policy: Quizes 3	30%. Final exam 7	70%					
B: The total score is between 65 and 79.99. C: The total score is between 55 and 64.99. Examination Examination(Face to Face) Details of examination Other information Reference URL Office hours Office Hour Friday 11:00-12:00 By appointment 08:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	A: The total score is 80	or more.						
C: The total score is between 55 and 64.99. Examination 定期試験を実施(対面) Examination(Face to Face) Details of examination Other information Other information Other information Office hours Office Hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	B: The total score is be	tween 65 and 79	.99.					
Examination 定期試験を実施(対面) Examination(Face to Face) Details of examination Other information Reference URL Office hours Office Hour Friday 11:00–12:00 By appointment 08:30–12:00, 13:30–16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	C: The total score is be	tween 55 and 64	.99.					
Examination 定期試験を実施(対面) Examination(Face to Face) Details of examination Other information Content information Office hours Office hour Office Hour Friday 11:00–12:00 By appointment 08:30–12:00, 13:30–16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar								
Examination Examination(Face to Face) Details of examination Other information Reference URL Office hours Office Hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	Fxamination							
Activities of examination Details of examination Other information Reference URL Office hours Office Hour Friday 11:00–12:00 By appointment 08:30–12:00, 13:30–16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	定期試験を実施(対面)							
Details of examination Other information Other information Reference URL Office hours Office Hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	Examination (Face to Face	ce)						
Other information Reference URL Office hours Office Hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	Details of examination	00)						
Other information Reference URL Office hours Office Hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	Bodano er oxammadem							
Weight of the second state of the s								
Reference URL Office hours Office Hour Friday 11:00–12:00 By appointment 08:30–12:00, 13:30–16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	Other Information							
Reference URL Office hours Office Hour Friday 11:00–12:00 By appointment 08:30–12:00, 13:30–16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar								
Office hours Office Hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	Reference URL							
Office hours Office Hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar								
Office Hour Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	Office hours							
Friday 11:00-12:00 By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	Office Hour							
By appointment 08:30-12:00, 13:30-16:30 on weekday will be available. Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	Friday 11:00-12:00							
Relations to attainment objectives of learning and education Key words elementary Japanese, grammar	By appointment 08:30-1	2:00, 13:30-16:3	0 on weekday will	l be available.				
Relations to attainment objectives of learning and education Key words elementary Japanese, grammar								
Key words elementary Japanese, grammar	Relations to attainment	obiectives of le	arning and educat	tion				
Key words elementary Japanese, grammar								
Key words elementary Japanese, grammar								
Key words elementary Japanese, grammar								
Key words elementary Japanese, grammar								
Key words elementary Japanese, grammar								
elementary Japanese, grammar	Kev words							
	elementary Jananese o	rammar						
	elonionical y oupdriede, gi							

(M40110020)Ethics for Researchers[Ethics for Researchers]

Subject name[English]	Ethics for Researc	Ethics for Researchers[Ethics for Researchers]					
Schedule number	M40110020	Subject area	General	Required or	Required		
			courses	elective			
Time of starting a course	Fall1 term	Day of the	Wed.1~1	Credit(s)	1		
		week,period					
Faculty	Graduate Program	for Master's Degre	e	Subject grade	1~		
Department Offered	Mechanical Engi	neering, Architect	ture and Civil	Beggining	M1		
	Engineering, Elec	trical and Electro	onic Information	grade			
	Engineering, Com	nputer Science a	and Engineering,				
	Environmental and Life Sciences						
Charge teacher name[Roman	教務委員会副委員	員長,原 邦彦,上	.野 未貴 kyoumu	iinkai fukuiintyou,	HARA Kunihiko,		
alphabet mark]	UENO Miki						
Numbering	COM MAS51015						

Objectives of class

Assist graduate students as they undertake research activities and promote an understanding of the inherent ethical problems; lead students to think independently and exercise normative consciousness of research ethics through ethics education in research in accordance with goals of scientific education and research and characteristics of individual research specialties.

Contents of class

* 1st week: Introduction, 1st module("Research Misconduct") in e-learning

- * 2nd 6th week: 2nd 7th modules in e-learning
- 2nd week: "Ethical Issues in the Management of Data in Engineering Research"

- 3rd week: "Responsible Authorship"

- 4th week: "Ethical Issues in the Peer Review and Publication of Engineering Research" & "Collaborative Research in Engineering Fields"
- 5th week: "Whistleblowing and the Obligation to Protect the Public"
- 6th week: "Managing Public Research Funds"
- * ~7th week: Discussion with supervisor
- * 8th week: make a final report

Self Preparation and Review

Students will need to refer to their textbook to prepare for and review each lesson.

Related subjects

Philosophy of Science and Technology, Ethics for Engineers

Notes for textbook

Notes for reference

For the Sound Development of Science ?The Attitude of a Conscientious Scientist Japan Society for the Promotion of Science Editing Committee , MARUZEN PUBLISHING 2015 ISBN978-4-621-08938-5

(PDF:https://www.jsps.go.jp/j-kousei/data/rinri.pdf)

Goals to be achieved

To prevent misconduct and promote fair research activities, this course provides knowledge and techniques regarding research ethics in accordance with characteristics of each graduate student's research specialties.

Evaluation of achievement

[Evaluation method] Final exam(100%)

[Evaluation basis]

Those who take and pass the short test after each unit of e-learning contents will be evaluated with following basis.

- A: Achieved all goals and obtained 80 points or higher (out of 100) as total score of exams
- B: Achieved most goals and obtained 65 points or higher (out of 100) as total score of exams
- C: Achieved more than half of specified goals and obtained 55 points or higher (out of 100) as total score of exams

Examination
レポートで実施
By Report
Details of examination
By report
Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

機械工学専攻 (B)技術者としての正しい倫理観と社会性 技術者としての専門的・倫理的責任を自覚し、社会における技術的課題を設定・解決・評価する能力 電気・電子情報工学専攻 (B)技術者としての専門的・倫理的責任を自覚し、社会における技術的課題を設定・解決・評価する能力 情報・知能工学専攻 (B)技術者としての専門的・倫理観と社会性 技術者としての専門的・倫理観と社会性 技術者としての専門的・倫理観と社会性 技術者としての専門的・倫理観と社会性 技術者としての専門的・倫理観と社会性 技術者としての専門的・倫理観と社会性 技術者としての専門的・倫理観と社会性 技術者としての専門的・倫理観と社会性 技術者としての専門的・倫理観と社会性 実術市システム学専攻 (B)技術者としての正しい倫理観と社会性 実践的・創造的・指導的な技術者としての社会的・倫理的責任を自覚し、技術的課題を解決する能力

Key words

Research Ethics, Conflict of Interest, Legal Compliance, Research Misconduct, Confidentiality Obligation, Security Export Control Policy, Copyright, Professionalism

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

Subject name[English]	Seminar on Mech	anical Engineering I	Seminar on Mech	anical Engineering I]		
Schedule number	M41610010	Subject area	Advanced	Required or	Required	
		Calgoot a ca	Mechanical	elective	. loquin ou	
			Engineering	ciccure		
Time of starting a course	Vear	Day of the	Intensive	Credit(e)	4	
Time of starting a course	i cai	weak period	Incensive	Oledic(s)	7	
Faculty	Cuaduata Duamuan	week,period		Subject mede	1	
	Graduate Program	i for Master's Degre	e	Subject grade	~ ↓	
Department Offered	Mechanical Engin	eering		Beggining		
	o1.5 批 改 千 日 1			grade		
Charge teacher name_Roman	SI杀教務安員I	kei kyomu lin-S				
alphabet mark						
Numbering	MEC_MAS51015					
Objectives of class						
The seminar aims to provide a br	oad understanding	of the mechanical e	ngineering availab	le for the master the	esis research of a	
student.						
Contents of class						
The class provides both of funda	amental knowledge	of his/her master t	hesis research w	ork and the most ad	vanced results in	
the related field by reading rese	earch papers and r	nonographs. The co	ontents of the cla	ass depend on the s	supervisor. To be	
announced by individual supervise	ors.	U I U U				
Self Preparation and Review						
Related subjects						
Notes for textbook						
Textbook or material will be made	available from the	supervisors				
Notes for reference						
Goals to be achieved						
To acquire fundamental knowledg	e of individual rese	arch fields.				
To acquire the ability to find prob	lems, the ability to	solve the problems,	and the presenta	tion skill.		
Evaluation of achievement						
Coursework presentation and/or	report					
Examination	Toport.					
試験期間内には何も行わたい						
None during even period						
Details of examination						
Other information						
Reference LIRI						
Office hours						
Relations to attainment objective	s of learning and e	ducation				
Key werde						
Ney words						

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

Subject name[English]	Seminar on Mech	nanical Engineering II	[Seminar on Mecha	anical Engineering II		
Schedule number	M41610020	Subject area	Advanced	Required or	Required	
			Mechanical	elective		
			Engineering			
Time of starting a course	Year	Day of the	Intensive	Credit(s)	2	
		week,period				
Faculty	Graduate Progra	m for Master's Degre	ee	Subject grade	2~	
Department Offered	Mechanical Engin	neering		Beggining	M1	
				grade		
Charge teacher name[Roman	S1系教務委員1	kei kyomu Iin−S				
alphabet mark]						
Numbering	MEC_MAS61015					
Objectives of class						
The seminar aims to provide a br	oad understanding	of the mechanical e	ngineering available	e for the master the	sis research of a	
student.						
Contents of class						
The class provides both of funda	amental knowledge	of his/her master t	hesis research wo	rk and the most ad	vanced results in	
the related field by reading rese	earch papers and i	monographs. The co	ontents of the clas	ss depend on the s	upervisor. To be	
announced by individual supervise	ors.					
Self Preparation and Review						
Related subjects						
-						
Notes for textbook						
Textbook or material will be made	available from the	supervisors				
Notes for reference		Supervisors.				
Goole to be achieved						
	o of individual was	anah fialda				
To acquire fundamental knowledg	e of individual rese	earch fields.	and the presentat	an akill		
To acquire the ability to find proc	nems, the admity to	solve the problems,	and the presentat	ion skill.		
Evaluation of achievement						
Coursework presentation and/or	report					
Eveningtion	report.					
試験期間 由に け 何 た た わ た い						
武映朔间中には凹む111/200						
None during examperiod						
Other information						
Other Information						
Reference URL						
Office hours						
Relations to attainment objective	s of learning and e	ducation				
1						
Key words						

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

Subject name[English]	Thesis Research	on Mechanical Engi	neering[Thesis Res	earch on Mechanica	I Engineering]	
Schedule number	M41610030	Subject area	Advanced	Required or	Required	
			Mechanical	elective		
			Engineering			
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6	
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	1~2	
Department Offered	Mechanical Engin	eering		Beggining	M1, M2	
Ohenne teachar nama[Baman	01 云	kai kuannu lin-S		grade		
Charge teacher name_Roman	51 未软伤安良 1	kei kyomu iin-s				
	MEC MASS1015					
The thesis research aims to pr understanding of relevant knowle	ovide a practical e dge.	experience of resea	rch work, and to	acquire research s	kills with a deep	
Contents of class The research subject depends research subjects. Discuss with y	on the supervisor our supervisor.	and the research	group you join. In	dividual students w	ill have different	
Self Preparation and Review						
Related subjects						
Notes for textbook						
Reference and material will be av	ailable from the sup	bervisor.				
Notes for reference						
Goals to be achieved						
To get something new on individu	al research fields.					
To develop your research skills in	icluding planning an	d presentation skills	3.			
Evaluation of achievement						
Examination						
None during exam period						
Details of examination						
Other information						
Reference URL						
Office hours						
Pelations to attainment objectives of learning and education						
relations to attainment objectives of learning and education						
Key words						

M41610030)Thesis Research on	Mechanical Engineering	Thesis Research on	Mechanical Engineering
	MOUTAINOAL LIGHTOUTING		

Subject news[Endich]	Thesis Desserve	on Machanical Engin	o o vin e Thoois Doo	aanah an Maahaniaa	L En etin e entin e]	
	MA1610020	Subject and Engin	Advensed			
Schequie numder	10141010030	Subject area	Machariced	rtequirea or	Required	
				01000140		
Time of starting a service	2Vears	Day of the	Intensivo	Credit(a)	6	
nme or starting a course	2 Tears	weak period	Intensive	Great(S)	U	
Faculty	Graduate Program	n for Master's Degre		Subject grade	1~1	
Department Offered	Mechanical Engin	eering		Beggining	M1 M2	
		001115		grade		
Charge teacher name[Roman	S1系教務委員	1系各教員 1kei kvor	mu Iin-S. 1kei kakı	ukvouin	1	
alphabet mark]			,	-		
Numbering	MEC_MAS61015					
Objectives of class						
The thesis research aims to pr	ovide a practical e	experience of resea	rch work, and to	acquire research s	kills with a deep	
understanding of relevant knowle	dge.					
Contents of class						
The research subject depends	on the supervisor	and the research	group you join. In	dividual students w	ill have different	
research subjects. Discuss with y	our supervisor.					
Self Preparation and Review						
Related subjects						
-						
Notes for textbook						
Reference and material will be av	ailable from the sur	pervisor.				
Notes for reference						
Goals to be achieved						
To get something new on individu	al research fields					
To develop your research skills in	icluding planning an	d presentation skills				
Evaluation of achievement			•			
Evamination						
試験期間中には何も行わたい						
None during exam period						
Details of examination						
Other information						
Reference LIRI						
Uffice hours						
Relations to attainment objectives of learning and education						
Key words						
Nay Words						

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

Subject name[English]	Thesis Research	on Mechanical Engir	neering[Thesis Re	search on Mechanica	l Engineering]		
Schedule number	M4161003T	Subject area	Advanced	Required or	Required		
			Mechanical	elective			
			Engineering				
Time of starting a course	Year	Day of the	Intensive	Credit(s)	6		
		week,period					
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	2~		
Department Offered	Mechanical Engin	eering		Beggining	M1		
	0.1万批办千日	· T 权 北 日		grade			
Charge teacher name[Roman	S 糸教務安員,	I 糸谷教員 I kei kyoi	nu lin-S, Tkei kak	ukyouin			
alphabet mark							
					lille side e dese		
The thesis research aims to pr	ovide a practical e	experience of resea	rch work, and to	acquire research s	kills with a deep		
understanding of relevant knowled	uge.						
Ountants of days							
The response cubicat denoted	on the automic	and the uses and			اللهميرم وانطوم ومراجع		
research subject Discuss with	on the supervisor	and the research	group you join. If	iuividuai students W	m nave different		
Self Preparation and Paview	our supervisor.						
Deleted subjects							
Related subjects							
Notes for textbook							
Reference and material will be av	ailable from the su	bervisor.					
Notes for reference							
Goals to be achieved							
To get something new on individu	al research fields.						
To develop your research skills in	iciuding planning ar	o presentation skills					
Evaluation of achievement							
試験期間中には何も行わない							
None during exam period							
Decails of examination							
Other information							
Other Information							
Peference LIDI							
	Keterence UKL						
UTTICE hours							
Relations to attainment objective	s of learning and e	ducation					
Key words							
itey words							

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

Subject name[English]	Seminar on Mecl	hanical Engineering[S	Seminar on Mechan	ical Engineering]	
Schedule number	M41610040	Subject area	Advanced	Required or	Required
			Mechanical	elective	
			Engineering		
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Progra	m for Master's Degre	ee	Subject grade	2~
Department Offered	Mechanical Engir	neering		Beggining	M1
				grade	
Charge teacher name[Roman	S1系教務委員	1kei kyomu Iin-S			
alphabet mark]					
Numbering	MEC_MAS61015				
Objectives of class					
The seminar aims to provide a br	oad understanding	; of the mechanical e	ngineering available	e for the master the	sis research of a
student.					
Contents of class					
The class provides both of funda	mental knowledge	of his/her master t	hesis research wo	rk and the most ad	vanced results in
the related field by reading rese	arch papers and	monographs. The co	ontents of the clas	ss depend on the s	upervisor. To be
announced by individual supervise	ors.				
Self Preparation and Review					
Related subjects					
Notes for textbook					
Textbook or material will be made	available from the	e supervisors.			
Notes for reference					
Goals to be achieved					
To acquire fundamental knowledg	e of individual rese	earch fields.			
To acquire the ability to find prob	lems, the ability to	solve the problems,	and the presentat	ion skill.	
Evaluation of achievement					
Coursework, presentation and/or	report.				
Examination					
試験期間中には何も行わない					
None during exam period					
Details of examination					
Other information					
Reference URL					
Office have					
Omce nours					
Relations to attainment objective	s of learning and o	education			
Key words					

(M41610050)Internship[Internship]

Subject name[English]	Internship[Interns	ship]			
Schedule number	M41610050	Subject area	Advanced	Required or	Required
			Mechanical	elective	. to quin o u
			Engineering	000000	
Time of starting a course	Fall term	Day of the	Intensive	Credit(e)	0
Time of starting a course		Day of the	Incensive	Orbuil(s)	0
Faculty	Graduate Program	n for Master's Degre		Subject grade	2~
Department Offered	Mechanical Engin	eering		Bergining	2 M1
				grade	
Charge teacher name[Roman	S1系教務委員1	kei kvomu lin-S		Brade	
alphabet mark]					
Numbering	MEC MASS1015				
				. .	
Students are expected to addres	ss problems in a s	pecialized field in a	company or resear	rch institute. The o	objectives of this
subject are to experience practic	cal research and d	levelopment and to	cultivate the practi	cal problem-solvin	g ability, planning
ability, and creativity.					
Contents of class					
In order to cultivate the practical	problem-solving a	bility, academic and	company/institutio	nal supervisors will	provide practical
problems in a specialized field thr	ough close commu	nication.			
Self Preparation and Review					
Studens are expected to discuss	a preferable inters	hip topic with super	visors before startir	ng it.	
Related subjects					
Notes for textbook					
Follow instructions provided by a	/inittion	al aumann da ana			
Follow Instructions provided by co	ompany/institution	al supervisors.			
Notes for reference					
Goals to be achieved					
While engaging practical activities	s in a company or	research institution	for several months	, students are exp	ected to improve
the practical problem-solving abil	ity, planning ability,	and creativity as we	ell as an internation	al way of thinking.	
Evaluation of achievement					
Comprehensive evaluation base	d on students' r	eports and evaluat	tion sheets by ac	ademic and com	pany/institutional
supervisors.					
A: 80 or higher (out of 100 points), B: 65 or higher (d	out of 100 points) C:	55 or higher (out o	f 100 points)	
Examination					
試験期間中には何も行わたい					
None during exam period					
None during example of					
Other information					
Reference URL					
Office hours					
Office flours					
Relations to attainment objective	s of learning and e	ducation			
Key words					

ticromachinir ticromachinir title30040 all2 term araduate Pro- techanical Er techanical E	ng Engineering[Micr gram for Master's I ngineering HIBATA Takayuki 225 5, the so-called bassive component hemical systems, The objective of thi eir application in th o Mechanical Syste SVD) CVD) CVD)	MEMS, can be source in the integrate and so on. The is course is to in the development of the MEMS)	defined as mini defined as mini ed circuits (IC) fr mEMS field ha troduce fundamen f MEMS devices.	Required or elective Credit(s) Subject grade Beggining grade	Elective 1 1 1~ M1 M1 M1 Elective
iall2 term iall2 term iraduate Pro iraduate Pro iechanical Er iechanical Er iechanic	gram for Master's I ngineering HIBATA Takayuki 225 5°, the so-called bassive component hemical systems, The objective of thi eir application in th o Mechanical Syste 2VD) CVD) CVD)	Subject area Day of the week,period Degree MEMS, can be ts, and integrate and so on. The is course is to in the development o em (MEMS)	Advanced Mechanical Engineering Tue.1~1 defined as mini d circuits (IC) fr MEMS field ha troduce fundamen f MEMS devices.	Required or elective Credit(s) Subject grade Beggining grade	Elective 1 1 1~ M1 M1 M1 Elective
all2 term araduate Pro, fechanical Er 能田 隆行 SI IEC_MAS530 cal Systems actuators, p bio-electroc ast decade. T gies), and th Micro Electro by deposition (F deposition (F	gram for Master's I ngineering HIBATA Takayuki 225 5, the so-called bassive component hemical systems, The objective of thi eir application in th o Mechanical Syste 2VD) CVD) CVD)	Day of the week,period Degree MEMS, can be ts, and integrate and so on. The is course is to in the development o em (MEMS)	defined as mini ed circuits (IC) fr MEMS field ha troduce fundamen f MEMS devices.	Credit(s) Subject grade Beggining grade	1 1~ M1 ms that consist of in micromechanics the most excitin chining technologie
araduate Pro lechanical Er 他们的一个的一个的一个的一个的一个的一个的一个。 actuators, p bio-electroc ast decade. The orgies), and the Micro Electroc ast decade. The orgies of the orginal set of t	gram for Master's I ngineering HIBATA Takayuki 225 5, the so-called bassive component hemical systems, The objective of thi reir application in th o Mechanical Syste 2VD) CVD) CVD)	MEMS, can be ts, and integrate and so on. The is course is to in the development o em (MEMS)	defined as mini ed circuits (IC) fr e MEMS field ha troduce fundamen f MEMS devices.	Subject grade Beggining grade iaturized system or applications is been one of itals of micromad	1~ M1 ns that consist c in micromechanics the most excitin chining technologie
techanical Er 集田 隆行 SI <u>IEC_MAS530</u> cal Systems actuators, p bio-electroc ast decade. T gies), and th Micro Electro deposition (F deposition	ngineering HIBATA Takayuki 225 5 ^{°°} , the so-called bassive component hemical systems, The objective of thi neir application in th o Mechanical Syste 2 PVD) CVD) CVD)	MEMS, can be ts, and integrate and so on. The is course is to in ne development o em (MEMS)	defined as mini ed circuits (IC) fr e MEMS field ha troduce fundamen f MEMS devices.	Beggining grade	M1 ns that consist c in micromechanics the most excitin chining technologie
桂田 隆行 SI MEC_MAS5300 cal Systems actuators, p bio-electroc ast decade. T gies), and th Micro Electro deposition (F deposition	HIBATA Takayuki 225 5 [°] , the so-called bassive component hemical systems, The objective of this ieir application in the o Mechanical System 2 VD) CVD) 1 review each lesson	MEMS, can be ts, and integrate and so on. The is course is to in ne development o em (MEMS)	defined as mini ed circuits (IC) fo e MEMS field ha troduce fundamen f MEMS devices.	iaturized system or applications s been one of itals of micromad	ns that consist c in micromechanics the most excitin chining technologie
IEC_MAS530 cal Systems actuators, p bio-electroc ast decade. T gies), and th Micro Electro deposition (F deposition (F deposition (C etroforming ses ad discussion ew prepare and p MS technolog	225 ", the so-called passive component hemical systems, The objective of this ieir application in the o Mechanical System PVD) CVD) review each lesson	MEMS, can be ts, and integrate and so on. The is course is to in ne development o em (MEMS)	defined as mini d circuits (IC) fo MEMS field ha troduce fundamen f MEMS devices.	iaturized system or applications is been one of itals of micromad	ns that consist c in micromechanics the most excitin chining technologie
IEC_MAS530 cal Systems actuators, p bio-electroc ast decade. T gies), and th Micro Electro y deposition (F deposition (F deposition (C etroforming ses ad discussion ew orepare and p MS technolog	225 5 ^{°°} , the so-called bassive component hemical systems, The objective of thi ieir application in th o Mechanical Syste PVD) CVD) review each lesson	MEMS, can be ts, and integrate and so on. The is course is to in <u>ne development o</u> em (MEMS)	defined as mini ed circuits (IC) fo MEMS field ha troduce fundamen f MEMS devices.	iaturized system or applications is been one of atals of micromad	ns that consist c in micromechanics the most excitin chining technologie
cal Systems actuators, p bio-electroc ast decade. T gies), and th Micro Electro by deposition (F deposition (F deposition (C troforming ses d discussion ew prepare and p MS technolog	s ⁷⁷ , the so-called bassive component hemical systems, The objective of thi leir application in th o Mechanical Syste PVD) CVD) review each lesson	MEMS, can be ts, and integrate and so on. The is course is to in ne development o em (MEMS)	defined as mini ed circuits (IC) fr MEMS field ha troduce fundamen f MEMS devices.	iaturized system or applications is been one of atals of micromad	ns that consist c in micromechanics the most excitin chining technologie
of physics a or this class. MS technolog	gies can be obtaine nd chemistry is req gies can be obtaine	d from the follow quired. d from the follow	ing website; http:/	//www.memsnet.	.org/mems/
look title	Fundamentals of	Microfabrication	n (2nd ed.): The	ISBN	9780849308260
uthor	Marc J. Madou	Publisher	CRC Press	Publish year	2002
look title	Introduction to Mi	crofabrication		ISBN	9780470851067
uthor	Sami Franssila	Publisher	John Wiley & Sons	Publish year	2004
look title	The MEMS Handb	ook (2nd ed.)		ISBN	9780849321061
uthor	Mohamed Gad− el−Hak	Publisher	CRC Press	Publish year	2006
of the fundar	mentals of microma aracteristics of pho	achining technolo tolithography.	gies for MEMS.		
	ook title uthor ook title uthor uthor	Science of Miniati uthor Marc J. Madou ook title Introduction to Mi uthor Sami Franssila ook title The MEMS Handb uthor Mohamed Gad- el-Hak of the fundamentals of micromaciple and characteristics of phila	Science of Miniaturization uthor Marc J. Madou Publisher ook title Introduction to Microfabrication uthor Sami Franssila Publisher ook title The MEMS Handbook (2nd ed.) uthor Mohamed Gad- el-Hak Publisher	Science of Miniaturization uthor Marc J. Madou Publisher CRC Press ook title Introduction to Microfabrication John Wiley & Sons uthor Sami Franssila Publisher John Wiley & Sons ook title The MEMS Handbook (2nd ed.) Uthor Mohamed Gad- el-Hak Publisher CRC Press of the fundamentals of micromachining technologies for MEMS. ciple and characteristics of photolithography. Carteristics Carteristics	Science of Miniaturization Publisher CRC Press Publish year ook title Introduction to Microfabrication ISBN uthor Sami Franssila Publisher John Wiley & Publish year ook title The MEMS Handbook (2nd ed.) ISBN uthor Mohamed Gad- Publisher CRC Press el-Hak Publisher CRC Press Publish year

(5) To apply knowledge of micromachining technologies to the design and manufacturing of microdevices. **Evaluation of achievement** Students will be evaluated by presentation (70%) and classroom performance (30%). An oral presentation on micromachining technologies for the fabrication of $\ensuremath{\mathsf{MEMS}}$ devices will be imposed during the course of class. [Evaluation basis] Students who attend all classes will be evaluated as follows: A: Achieved all goals and obtained total points on the above evaluation, 80 or higher (out of 100 points). B: Achieved 75 % of goals and obtained total points on the above evaluation, 65 or higher (out of 100 points). C: Achieved 50 % of goals and obtained total points on the above evaluation, 55 or higher (out of 100 points). Examination 授業を実施 **Regular Class** Details of examination Other information Reference URL https://www.tut.ac.jp/english/schools/faculty/me/64.html **Office hours** Anytime during regular working hours. Contact me by email before coming if possible. Relations to attainment objectives of learning and education Key words MEMS, Micromachining, Microfabrication, Photolithography, Wet etching, Dry etching, Physical vapor deposition (PVD), Chemical vapor deposition (CVD), Plating, Bonding processes

(M41630120)Time-frequency Analysis and Wavelet Transform[Time-frequency Analysis and Wavelet Transform]										
Subject	Time-freque	ncy Analysis and Wavel	et Transform[Tim	e-frequency Analys	sis and Wavelet	Transform]				
name[English]										
Schedule number	M41630120		Subject area	Advanced	Required or	Elective				
			-	Mechanical	elective					
				Engineering						
Time of starting a	Fall2 term		Day of the	Tue.2~2	Credit(s)	1				
course			week,period							
Faculty	Graduate Pro	Graduate Program for Master's Degree Su								
		grade								
Department Offered	Mechanical E	echanical Engineering M1								
•		0 0			grade					
Charge teacher	童 忠 SHO	Tadashi								
name[Roman										
alphabet mark]										
Numbering	MEC MAS55	025								
Objectives of class										
		c								
To obtain advanced kno	wieuge of time	-frequency analysis and	u image processi	ig by utilizing wavel	et transform.					
Optain advanced kno	owieage of time	rrequency analysis and	u image processii	ig by utilizing wavel	et transform.					
Contents of class										
1. Basic theory of time-	-frequency ana	lysis method will be brie	etly discussed.							
1)Shot-Time Fourier tra	anstorm									
2) The Wigner-Ville Dist	ribution									
3)Hilbert Transform and	l instantaneous	frequency analysis								
4)Wavelet transform										
2.Application of the way	elet Transform	n will be briefly discusse	ed.							
1) Time series signal an	alysis									
2) Image processing										
3) Abnormal detection										
4) Surface inspection										
1. Basic theory of time-	-frequency ana	lysis method will be brie	efly discussed.							
1)Shot-Time Fourier tra	ansform									
2)The Wigner-Ville Dist	ribution									
3)Hilbert Transform and	l instantaneous	frequency analysis								
4)Wavelet transform										
2.Application of the way	elet Transform	n will be briefly discusse	ed.							
1) Time series signal an	alysis									
2) Image processing										
3) Abnormal detection										
4) Surface inspection										
Self Preparation and R	eview									
Related subjects										
Basic knowledge of the	signal analysis									
Basic knowledge of the	signal analysis									
Notes for textbook	- · · · · · · · · · · · · · · · · · · ·									
Materials will be perpare	ed by lecturer.									
Mataniala or 201										
Materials will be perpare	ed by lecturer.									
	1	T			r					
Reference1	Book title	Frontiers in computi	ng technologies	for Manufacturing	ISBN					
		applications								
	Author	Y. Shimizu , Z.	Publisher	Springer	Publish year	2007				
		Zhang, R. Batres								
Reference2	Book title	Wavelets and analysis	;		ISBN					
	Author	M Holschneider	Publisher	Oxford	Publich voor					
					Fublian year					
				Droop						
Defemance	Deals the	Time Fue	h	Fress						
Keterence3	Book title	I Ime−Frequency Ana	Iysis		ISBN					

	Author	R.L.	Allen,	D.W.	Publisher	IEEE Press	Publish year	
		Mills						
Notes for reference								
Goals to be achieved								
Understanding the know	vledge of the ti	me-free	quency a	analysis	method and usin	g them in real applic	ation	
Understanding the know	vledge of the ti	me-frea	quency a	analysis	method and usin	g them in real applic	ation	
Evaluation of achievem	ent							
Interim report (50%) and	l term-end rep	ort (50%	6)					
Interim report (50%) and	l term-end rep	ort (50%	6)					
Examination								
レポートで実施								
By Report								
Details of examination								
Other information								
Room: D-610, E-mail: z	hang@me.tut.ac	c.jp						
Room: D-610, E-mail: z	hang@me.tut.ac	;jp						
Reference URL								
http://is.me.tut.ac.jp								
http://is.me.tut.ac.jp								
Office hours								
Relations to attainment	t objectives of	learning	g and ed	ucation				
Key words								
Wavelet transform, Tim	e-frequency ar	nalysis						
Wavelet transform, Tim	e−frequency ar	nalysis						

(M41630210)Advanced Mechanical Systems Design I[Advanced Mechanical Systems Design I]

Subject name[English]	Advanced Mecha	nical Systems Desig	n I[Advanced Med	hanical Systems Des	sign I]
Schedule number	M41630210	Subject area	Advanced	Required or	Elective
			Mechanical	elective	
			Engineering		
Time of starting a course	Fall term	Day of the	Mon 4~4	Gredit(s)	2
		week period			-
Feauthy	Graduata Program	n for Master's Degre	2	Subject grade	1~
Department Offered	Machanical Engin	a aring		Degrining	M1
Department Onered		eening		Deggining	
Charma tasahar nama[Barran	01	kai kuannu lin-S		grade	
	31 术权伤安良 1	kei kyömu im-3			
Numbering	WEC_WAS55025				
Objectives of class					
This lecture aims to provide a br	oad understanding	of the mechanical s	ystems design av	ailable for the maste	r thesis research
work of a student.					
Contents of class					
The class provides both of funda	amental knowledge	of his/her master t	hesis research wo	ork and the most adv	vanced results in
the related field by reading rese	arch papers and n	nonographs. The co	ntents of the cla	iss depend on the s	upervisor. To be
announced by individual supervise	ors.				
Self Preparation and Review					
· · · · · · ·					
Balatad aukia ata					
Related subjects					
Notes for textbook					
Textbook or material will be made	e available from the	supervisors.			
Notes for reference					
Goals to be achieved					
To acquire fundamental knowledg	e of individual rese	arch fields			
To acquire the ability to find prob	leme the ability to	colve the problems	and the precentat	ion skill	
To acquire the ability to find prob	iems, the ability to	solve the problems	and the presentat	IOT SKIII.	
Evaluation of achievement					
Coursework, presentation and/or	report.				
Examination					
試験期間中には何も行わない					
None during exam period					
Details of examination					
Other information					
Reference URL					
Office hours					
Deletione to etteinment chiestin		d			
Relations to attainment objective	s or learning and e	aucation			
Key words					

Subject name[English] Advanced Materials and Manufacturing Process I[Advanced Materials and Ma Process I]								
Schedule number	Subject area Advanced Required M41630230 Subject area Advanced Required Mechanical Engineering Engineering Condition		Required or elective	Elective				
Time of starting a course	Fall term	Day of the week,period	Tue.4~4	Credit(s)	2			
Faculty Department Offered	Graduate Program for Master's Degree Subject grade 1~ Mechanical Engineering Beggining grade M1							
Charge teacher name[Roman alphabet mark]	S1系教務委員	1kei kyomu Iin−S						
Numbering	MEC_MAS54025							
Objectives of class This lecture aims to provide a br research work of a student. Contents of class The class provides both of funda	road understanding amental knowledge	of the materials ar of his/her master	d manufacturing p	rocess available for t	the master thes			
the related field by reading rese	earch papers and	monographs. The c	ontents of the cla	ass depend on the s	upervisor. To b			
Self Preparation and Review	ors.							
Related subjects								
Textbook or material will be made Notes for reference Goals to be achieved To acquire fundamental knowledg To acquire the ability to find prob Evaluation of achievement	e available from the ge of individual rese blems, the ability to r report.	e supervisors. earch fields. o solve the problems	s and the presenta	tion skill.				
Coursework, presentation and/or Examination 試験期間中には何も行わない None during exam period Details of examination								
Coursework, presentation and/or Examination 試験期間中には何も行わない None during exam period Details of examination Other information								
Coursework, presentation and/or Examination 試験期間中には何も行わない None during exam period Details of examination Other information Reference URL								
Coursework, presentation and/or Examination 試験期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours								
Coursework, presentation and/or Examination 試験期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objective	es of learning and o	aducation						

(M41630250)Advanced System, Control and Robotics I[Advanced System, Control and Robotics I]

Subject name[English]	Advanced System	. Control and Robot	tics I[Advanced Svs	tem. Control and R	obotics []			
Schedule number	M41630250	Subject area	Advanced	Required or	Flective			
	1111000200	Cubject al ca	Mechanical	elective	LICOLIVE			
			Engineering	01000140				
Time of starting a source	Eall tarms	Davi of the		One dit(a)	0			
lime of starting a course	Fall term	Day of the	Thu.4~4	Great(s)	2			
		week,period						
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	1~			
Department Offered	Mechanical Engine	eering		Beggining	M1			
	grade							
Charge teacher name[Roman	ər namə[Roman S 1系教務委員 1kei kyomu lin−S							
alphabet mark]								
Numbering	MEC_MAS55025							
Objectives of class								
This lecture aims to provide a bro	and understanding o	of the control and re	botios available for	the master thesis	recearch work of			
This lecture aims to provide a bro	Sau understanding d		DUCIUS available for	the master thesis	research work of			
a student.								
Contents of class								
The class provides both of funda	amental knowledge	of his/her master t	hesis research wor	k and the most ad	vanced results in			
the related field by reading rese	earch papers and m	nonographs. The co	ntents of the clas	s depend on the s	upervisor. To be			
announced by individual superviso	ors.							
Self Preparation and Review								
Palatad aubiaata								
Notes for textbook								
Textbook or material will be made	e available from the	supervisors.						
Notes for reference								
Or da ta ha ashirund								
Goals to be achieved								
I o acquire fundamental knowledg	e of individual resea	arch fields.						
To acquire the ability to find prob	lems, the ability to	solve the problems,	and the presentation	on skill.				
Evaluation of achievement								
Coursework presentation and/or	report							
Examination								
試験期間内には何も行わたい								
武殿労町中によ问む1117ない Name during even period								
None during example to a								
Details of examination								
Other information								
Peference LIPI								
Office hours								
Relations to attainment objective	s of learning and e	ducation						
Key words								

(M41630270)Advanced Energy an	d Environmental En	gineering I[A	dvance	ed Energy and Env	ironmental Engineer	ring []		
Subject name[English]	Advanced Energy Engineering I]	and Enviro	nmenta	al Engineering I[A	dvanced Energy a	nd Environmental		
Schedule number	M41630270	Subject are	a	Advanced Mechanical Engineering	Required or elective	Elective		
Time of starting a course	Fall term	Day of week.perio	the d	Fri.4~4	Credit(s)	2		
Faculty	Graduate Program for Master's Degree Subject grade 1~							
Department Offered	Mechanical Engineering Beggining M1 grade							
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S							
Numbering	MEC_MAS56025							
Objectives of class This lecture aims to provide a bro- research work of a student. Contents of class	oad understanding o	f the energy	and er	nvironmental engin	eering available for	the master thesis		
The class provides both of funda the related field by reading rese announced by individual superviso	mental knowledge o arch papers and m ors.	of his/her m ionographs.	aster t The co	hesis research wo ntents of the clas	rk and the most ad ss depend on the s	lvanced results in supervisor. To be		
Self Preparation and Review								
Related subjects								
Notes for textbook Textbook or material will be made Notes for reference	available from the s	supervisors.						
Goals to be achieved								
To acquire fundamental knowledg To acquire the ability to find prob	e of individual resea lems, the ability to s	rch fields. solve the pro	blems,	and the presentat	ion skill.			
Evaluation of achievement								
Coursework, presentation and/or	report.							
Examination 試験期間中には何も行わない None during exam period								
Other information								
Office hours								
Relations to attainment objective	s of learning and ed	lucation						
Key words								

(M41630320)Properties and Appli	cations of Engineer	ring Materials[Prope	orties and Application	ons of Engineering I	Materials]
Subject name[English]	Properties and Engineering Mater	Applications of E rials]	ngineering Materia	ls[Properties and	Applications of
Schedule number	M41630320	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Fall2 term	Day of the week.period	Thu.2~2	Credit(s)	1
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	1~
Department Offered	Mechanical Engine	eering		Beggining	M1
.				grade	
Charge teacher name[Roman alphabet mark]	三浦 博己 MIUR	A Hiromi			
Numbering	MEC_MAS54015				
Objectives of class					
Properties and applications of en	ngineering materials	s, especially of met	allic ones, are int	roduced and discu	ssed. Trough the
discussion and weekly reports, ba	sic knowledge abou	ut engineering mater	ials would be acquir	red.	
Contents of class					
Properties and applications of e	ngineering material	ls are introduced a	and discussed. Disc	sussions on the re	ports are mainly
carried out, which are prepared in	advance according	g to weekly subjects	i.		
Self Preparation and Review					
Basic knowledge on metallic mate Related subjects	rials is mandatory.				
Notes for textbook					
Notes for reference					
Goals to be achieved					
Understand and obtain basic know	wledge about prope	rties and application	s of engineering ma	aterials	
Evaluation of achievement	Nougo about p. er		3 01 01g.100		
Weekly reports and discussion 10	೧%				
Evaluation according to TUT stan	udard				
Evaluation according to 101 otal.	uaru.				
塔堂を宇施					
Regular Class					
Details of examination					
No final test					
Other information					
Deference D					
Office hours					
Relations to attainment objective	s of learning and e	ducation			
機械工学専攻 (A)幅広い人間性と考え方 人間社会を地球的な視点から多可 (C)工学的知識の獲得とその発展 重要な学術・技術分野の理論・応 (F)最新の技術や社会環境の変行 社会,環境,技術等の変化に対応	面的にとらえ、自然々 髪的活用能力 用知識を自発的にѮ 化に対する探究心と ふして、生涯にわた・	と人間との共生、人 獲得し、発展的に活 と持続的学習力 って自発的に学習す	類の幸福・健康・福行 用できる能力 る能力	祉について考える能	t

Key words

Metallic materials, apprication

(M41630333)Advances in Mechanical Design[Advances in Mechanical Design]

Subject name[English]	Advances in Mech	Advances in Mechanical Design[Advances in Mechanical Design]					
Schedule number	M41630333	Subject area	Advanced	Required or	Elective		
			Mechanical	elective			
			Engineering				
Time of starting a course	Fall2+Spring1	Day of the	Tue.1~1	Credit(s)	2		
	week,period						
Faculty	Graduate Program for Master's Degree Subject grade 2~2						
Department Offered	Mechanical Engine	ering		Beggining	M2		
	grade						
Charge teacher name[Roman	河村 庄造, 柴田 隆行 KAWAMURA Shozo, SHIBATA Takayuki						
alphabet mark]							
Numbering	MEC_MAS53025						

Objectives of class

Fall 2 : Micromachining Engineering (Shibata)

"Micro Electro Mechanical Systems", the so-called MEMS, can be defined as miniaturized systems that consist of micromachined sensors, actuators, passive components, and integrated circuits (IC) for applications in micromechanics, nanoscience, photonics, bio-electrochemical systems, and so on. The MEMS field has been one of the most exciting technologies during the past decade. The objective of this course is to introduce fundamentals of micromachining technologies (microfabrication technologies), and their application in the development of MEMS devices.

Spring 1 : Vibration Engineering (Kawamura)

This lecture will provide the knowledge of modal analysis method and component mode synthesis method to treat a huge degree of freedom system.

Fall 2 : Micromachining Engineering (Shibata)

"Micro Electro Mechanical Systems", the so-called MEMS, can be defined as miniaturized systems that consist of micromachined sensors, actuators, passive components, and integrated circuits (IC) for applications in micromechanics, nanoscience, photonics, bio-electrochemical systems, and so on. The MEMS field has been one of the most exciting technologies during the past decade. The objective of this course is to introduce fundamentals of micromachining technologies (microfabrication technologies), and their application in the development of MEMS devices.

Spring 1 : Vibration Engineering (Kawamura)

This lecture will provide the knowledge of modal analysis method and component mode synthesis method to treat a huge degree of freedom system.

Contents of class

Fall 2 : Micromachining Engineering (Shibata)
1st week: Introduction of Micro Electro Mechanical System (MEMS)
2nd week: Photolithography
3rd week: Wet etching and Dry etching
4th week: Physical vapor deposition (PVD)
5th week: Chemical vapor deposition (CVD)
6th week: Plating and Electroforming
7th week: Bonding processes
8th week: Presentation and discussion

Spring 1 : Vibration Engineering (Kawamura)

Modal analysis for multi degree of freedom system

1: Introduction of modal analysis, undamped system

2: A system with proportional viscous damping (1) 3: A system with proportional viscous damping (2)

4: Compensate of higher vibration modes

Component mode synthesis method

5: Formulation of sub-systems

6: Modal synthesis using constraint modes (1)

7: Modal synthesis using constraint modes (2)

8: Modal synthesis using non-constraint modes

Fall 2 : Micromachining Engineering (Shibata)

1st week: Introduction of Micro Electro Mechanical System (MEMS)

2nd week: Photolithography

3rd week: Wet etching and Dry etching 4th week: Physical vapor deposition (PVD) 5th week: Chemical vapor deposition (CVD) 6th week: Plating and Electroforming 7th week: Bonding processes 8th week: Presentation and discussion Spring 1 : Vibration Engineering (Kawamura) Modal analysis for multi degree of freedom system 1: Introduction of modal analysis, undamped system 2: A system with proportional viscous damping (1) 3: A system with proportional viscous damping (2) 4: Compensate of higher vibration modes Component mode synthesis method 5: Formulation of sub-systems 6: Modal synthesis using constraint modes (1) 7: Modal synthesis using constraint modes (2) 8: Modal synthesis using non-constraint modes Self Preparation and Review Fall 2 : Micromachining Engineering (Shibata) Students are required to prepare and review each lesson. Useful information on MEMS technologies can be obtained from the following website; http://www.memsnet.org/mems/ Spring 1 : Vibration Engineering (Kawamura) Self-preparation and review are necessary. Fall 2 : Micromachining Engineering (Shibata) Students are required to prepare and review each lesson. Useful information on MEMS technologies can be obtained from the following website; http://www.memsnet.org/mems/ Spring 1 : Vibration Engineering (Kawamura) Self-preparation and review are necessary. **Related subjects** Fall 2 : Micromachining Engineering (Shibata) A fundamental knowledge of physics and chemistry is required. Spring 1 : Vibration Engineering (Kawamura) Dynamics, Vibration engineering, Mechanical vibration Fall 2 : Micromachining Engineering (Shibata) A fundamental knowledge of physics and chemistry is required. Spring 1 : Vibration Engineering (Kawamura) Dynamics, Vibration engineering, Mechanical vibration Notes for textbook Fall 2 : Micromachining Engineering (Shibata) No textbook is required for this class. Handouts will be prepared. Useful information on MEMS technologies can be obtained from the following website; http://www.memsnet.org/mems/ Spring 1 : Vibration Engineering (Kawamura) Handouts will be prepared Fall 2 : Micromachining Engineering (Shibata) No textbook is required for this class. Handouts will be prepared. Useful information on MEMS technologies can be obtained from the following website; http://www.memsnet.org/mems/ Spring 1 : Vibration Engineering (Kawamura) Handouts will be prepared Notes for reference Fall 2 : Micromachining Engineering (Shibata) 1) Fundamentals of Microfabrication (2nd ed.): The Science of Miniaturization Marc J. Madou, CRC Press, 2002, ISBN: 9780849308260

2) Introduction to Microfabrication

Sami Franssila, John Wiley & Sons, 2004, ISBN: 9780470851067 3) The MEMS Handbook (2nd ed.)

Mohamed Gad-el-Hak, CRC Press, 2006, ISBN: 9780849321061

Goals to be achieved

Fall 2 : Micromachining Engineering (Shibata)

To gain an understanding of the fundamentals of micromachining technologies for MEMS.

(1) To understand the principle and characteristics of photolithography.

(2) To understand the principle and characteristics of etching processes.

(3) To understand the principle and characteristics of deposition processes.

(4) To understand the principle and characteristics of bonding processes.

(5) To apply knowledge of micromachining technologies to the design and manufacturing of microdevices.

Spring 1 : Vibration Engineering (Kawamura)

(1) Understand the modal analysis for multi degree of freedom system

(2) Understand the component mode synthesis method

Fall 2 : Micromachining Engineering (Shibata)

To gain an understanding of the fundamentals of micromachining technologies for MEMS.

(1) To understand the principle and characteristics of photolithography.

(2) To understand the principle and characteristics of etching processes.

(3) To understand the principle and characteristics of deposition processes.

(4) To understand the principle and characteristics of bonding processes.

(5) To apply knowledge of micromachining technologies to the design and manufacturing of microdevices.

Spring 1 : Vibration Engineering (Kawamura)

(1) Understand the modal analysis for multi degree of freedom system

(2) Understand the component mode synthesis method

Evaluation of achievement

Fall 2 : Micromachining Engineering (Shibata)

Students will be evaluated by presentation (70%) and classroom performance (30%). An oral presentation on micromachining technologies for the fabrication of MEMS devices will be imposed during the course of class.

[Evaluation basis] Students who attend all classes will be evaluated as follows:

A: Achieved all goals and obtained total points on the above evaluation, 80 or higher (out of 100 points).

B: Achieved 75 % of goals and obtained total points on the above evaluation, 65 or higher (out of 100 points).

C: Achieved 50 % of goals and obtained total points on the above evaluation, 55 or higher (out of 100 points).

Spring 1 : Vibration Engineering (Kawamura)

Method: report (full score 100).

Level: achievement in the case upper 55 points.

Level A: upper 80 points, Level B: upper 65 points, Level C: upper 55 points

Fall 2 : Micromachining Engineering (Shibata)

Students will be evaluated by presentation (70%) and classroom performance (30%). An oral presentation on micromachining technologies for the fabrication of MEMS devices will be imposed during the course of class.

[Evaluation basis] Students who attend all classes will be evaluated as follows:

A: Achieved all goals and obtained total points on the above evaluation, 80 or higher (out of 100 points).

B: Achieved 75 % of goals and obtained total points on the above evaluation, 65 or higher (out of 100 points).

C: Achieved 50 % of goals and obtained total points on the above evaluation, 55 or higher (out of 100 points).

Spring 1 : Vibration Engineering (Kawamura)

Method: report (full score 100).

Level: achievement in the case upper 55 points.

Level A: upper 80 points, Level B: upper 65 points, Level C: upper 55 points

Examination

レポートで実施

By Report

Details of examination

Note:

Fall 2 : Micromachining Engineering (Shibata)

Regular Class (Presentation and discussion)

Other information

Fall 2 : Micromachining Engineering (Shibata)

Contact person: Prof. Takayuki Shibata, E-Mail: shibata@me.tut.ac.jp

Spring 1 : Vibration Engineering (Kawamura) Contact person: Prof. Shozo Kawamura E-Mail:kawamura@me.tut.ac.jp Fall 2 : Micromachining Engineering (Shibata) Contact person: Prof. Takayuki Shibata, E-Mail: shibata@me.tut.ac.jp

Spring 1 : Vibration Engineering (Kawamura) Contact person: Prof. Shozo Kawamura E-Mail:kawamura@me.tut.ac.jp Reference URL

Office hours

Fall 2 : Micromachining Engineering (Shibata) Anytime during regular working hours. Contact me by email before coming if possible.

Spring 1 : Vibration Engineering (Kawamura) Ask by E-mail. Fall 2 : Micromachining Engineering (Shibata) Anytime during regular working hours. Contact me by email before coming if possible.

Spring 1 : Vibration Engineering (Kawamura) Ask by E-mail. Relations to attainment objectives of learning and education

Key words

Modal analysis, Component mode synthesis method, MEMS, Micromachining, Microfabrication, Photolithography, Wet etching, Dry etching, Physical vapor deposition (PVD), Chemical vapor deposition (CVD), Plating, Bonding processes Modal analysis, Component mode synthesis method, MEMS, Micromachining, Microfabrication, Photolithography, Wet etching, Dry etching, Physical vapor deposition (PVD), Chemical vapor deposition (CVD), Plating, Bonding processes

(M41630340)Advances in Material Science and Manufacturing[Advances in Material Science and Manufacturing]

Subject name[English]	Advances in Material Science and M	anufacturing[Adv	ances in Material S	cience and Man	ufacturing]
Schedule number	M41630340	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Fall2+Spring1	Day of the week,period	Thu.2~2	Credit(s)	2
Faculty	Graduate Program for Master's Degr	ee		Subject grade	2~
Department Offered	Mechanical Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	三浦 博己, 福本 昌宏 MIURA Hiro	mi, FUKUMOTO N	Masahiro		
Numbering	MEC_MAS55025				

Objectives of class

- Understanding of properties and applications of engineering materials

- To understand fundamentals of advanced technology in materials joining, especially both in high performance thick coating formation by Thermal Spraying, Cold Spraying, Aero-sol Deposition, and in non-melting diffusion bonding by Friction Stir Welding.

- Understanding of properties and applications of engineering materials

- To understand fundamentals of advanced technology in materials joining, especially both in high performance thick coating formation by Thermal Spraying, Cold Spraying, Aero-sol Deposition, and in non-melting diffusion bonding by Friction Stir Welding.

Contents of class

1. Engineering materials and manufacturing processes

- 2. Crystal structures
- 3. Defects in crystals
- 4. Diffusion in sold
- 5. Phase diagrams of alloys
- 6. Strengthening of metallic materials
- 7. Composites
- 8. Half term exam

9. Fundamental of surface modification process and technology

10. Fundamentals of thermal spray process, Splat formation problem

11. Process control with Transition temperature & Transition pressure

12. Cold spraying and Aero-sol deposition process, Functional materials coating: photocatalyst, SOFC, nano coating,

intermetallic compound coating, etc.

13. Fundamental of Friction Stir Welding

14. Joining between disimillar materials by FSW

- 15. Friction spot welding, practical applications of FSW
- 16. Summarize and term-end report

1. Engineering materials and manufacturing processes

2. Crystal structures

- 3. Defects in crystals
- 4. Diffusion in sold
- 5. Phase diagrams of alloys
- 6. Strengthening of metallic materials

7. Composites

8. Half term exam

9. Fundamental of surface modification process and technology

10. Fundamentals of thermal spray process, Splat formation problem

- 11. Process control with Transition temperature & Transition pressure
- 12. Cold spraying and Aero-sol deposition process, Functional materials coating: photocatalyst, SOFC, nano coating, intermetallic compound coating, etc.
- 13. Fundamental of Friction Stir Welding
- 14. Joining between disimillar materials by FSW
- 15. Friction spot welding, practical applications of FSW

16. Summarize and term-end report

Self Preparation and Review

Basic knowledge necessary to understand lecture. Please read books suggested bellow in advance.

Basic knowledge necessary to understand lecture. Please read books suggested bellow in advance.

Related subjects

Basic knowledge on materials joining process is desirable.

Basic knowledge on materials joining process is desirable.

Notes for textbook

- Lecture using ppt.

- Handouts will be prepared for participants.

(Reference)

Required readings will be taken from a variety of reference books and research papers.

- Lecture using ppt.

- Handouts will be prepared for participants.

(Reference)

Required readings will be taken from a variety of reference books and research papers.

Reference1	Book title	Materials science and engineering					ISBN	978-1-118-
								31922-2
	Author	W.D.Ca	allister J	r and	Publisher	Willy	Publish	2017
		D.G.Re	ethwisch				year	
Reference2	Book title	Foundations of materials science and engineering					ISBN	978-007-
								131114-4
	Author	W.F.	Smith	and	Publisher	Mc Graw Hill	Publish	2011
		J.Hash	iemi				year	

Notes for reference

Goals to be achieved

1) Understanding of properties and applications of engineering materials explained in the lectures

2) Understand following items;

-Joining mechanism between dissimilar materials

-Features and mechanism of various joining methods

-Features and mechanism of thick and thin film coating

-Features of functionally gradient material and composite material

1) Understanding of properties and applications of engineering materials explained in the lectures

2) Understand following items;

-Joining mechanism between dissimilar materials

-Features and mechanism of various joining methods

-Features and mechanism of thick and thin film coating

-Features of functionally gradient material and composite material

Evaluation of achievement

- Short tests 50%, Final exam. 50%
- Interim report (10%) and term-end report (90%).
- Short tests 50%, Final exam. 50%
- Interim report (10%) and term-end report (90%).

Examination

レポートで実施

By Report

Details of examination

Other information

Masahiro Fukumoto: Room: D-503, ext.: 6692, e-mail: fukumoto@tut.jp Hiromi Miura: Room: D-508, ext.: 6697, e-mail: miura@me.tut.ac.jp Masahiro Fukumoto: Room: D-503, ext.: 6692, e-mail: fukumoto@tut.jp Hiromi Miura: Room: D-508, ext.: 6697, e-mail: miura@me.tut.ac.jp Reference URL (fukumoto) http://isf.me.tut.ac.jp/

(miura) http://www.str.me.tut.ac.jp/ (fukumoto) http://isf.me.tut.ac.jp/ (miura) http://www.str.me.tut.ac.jp/

Office hours

(fukumoto)anytime to e-mail address: fukumoto@tut.jp (miura) anytime to e-mail address: miura@me.tut.ac.jp (fukumoto)anytime to e-mail address: fukumoto@tut.jp (miura) anytime to e-mail address: miura@me.tut.ac.jp

Relations to attainment objectives of learning and education

(C)工学的知識の獲得とその発展的活用能力 重要な学術・技術分野の理論・応用知識を自発的に獲得し,発展的に活用できる能力

Key words

Joining in dissimilar maretials, Surface modification, Thermal spraying, Cold spraying, FSW Joining in dissimilar maretials, Surface modification, Thermal spraying, Cold spraying, FSW

(M41630353)Advances in Thermal and Fluid Mechanics[Advances in Thermal and Fluid Mechanics]

Subject name[English]	Advances in Thermal and Fluid Mechanics[Advances in Thermal and Fluid Mechanics]					
Schedule number	M41630353	Required or	Elective			
			Mechanical	elective		
			Engineering			
Time of starting a	Fall1 term	Day of the	Mon.1 ~ 1,Tue.2	Credit(s)	2	
course		week,period	~2			
Faculty	Graduate Program for Master's De	Subject	2~2			
		grade				
Department Offered	Mechanical Engineering	Beggining	M2			
		grade				
Charge teacher	飯田 明由, 柳田 秀記 IIDA Akiyoshi, YANADA Hideki					
name[Roman alphabet						
mark]						
Numbering	MEC_MAS56025					

Objectives of class

Applied Combustion Engineering by Professor Noda:

The global environment is a subject we must consider in our engineering activities. Some pollutions come from combustion and disperse into the atmosphere. Such phenomena take place in turbulent reacting flows. In the class, the mathematical treatment of such flows will be lectured. In paticular, we focus on modeling of turbulent combustion based on stochastic methods.

フルードパワーエ学(柳田)

加圧した流体(油, 空気, 水など)を利用して機械的な仕事を取り出すシステムであるフルードパワー機器・システムに関して, 基礎的事項, 機器を接続する管路内流体の動特性, フルードパワーに関する最近のトピックスについて講義する.

Applied Combustion Engineering by Professor Noda:

The global environment is a subject we must consider in our engineering activities. Some pollutions come from combustion and disperse into the atmosphere. Such phenomena take place in turbulent reacting flows. In the class, the mathematical treatment of such flows will be lectured. In paticular, we focus on modeling of turbulent combustion based on stochastic methods.

Fluid power engineering by Prof.Yanada:

Fluid power systems utilize pressurized fluid (oil, air, water) to transfer power and output mechanical power through fluid power actuators. In this class, students acquire knowledge of structures and theories of fluid power components and systems as well as dynamics of fluid in pipelines. In addition, students acquire information on recent topics of fluid power engineering.

Contents of class

Applied Combustion Engineering by Professor Noda:

1.Introduction

2.Premixed combustion

3.Nonpremixed combustion

4. Turbulent combustion

5.Statistical description of turbulent combustion

6.Flamelet model

7.Probability density function(pdf) model

8.Examination

フルードパワー工学(柳田担当) 1週目:フルードパワーシステムの概要 2週目:各種機器の基礎理論 3週目:機器および回路の効率 4週目:管路の動特性(一次元波動方程式) 5周目:管路の動特性(一次元波動方程式の解,水撃現象) 6周目:管路の動特性(非定常層流,周波数応答) 7週目:フルードパワーに関する最近の話題 8週目:フルードパワーに関する最近の話題(45分),試験(45分)

本講義は隔年で開講される. Applied Combustion Engineering by Professor Noda: 1.Introduction 2.Premixed combustion 3.Nonpremixed combustion 4.Turbulent combustion

5.Statistical description of turbulent combustion 6.Flamelet model 7.Probability density function(pdf) model 8.Examination							
Fluid poer engineering by Prof.Yanada: 1st week: One-dimensional wave equation and its solution in time domain for lossless lines 2nd week: Water hammer phenomenon 3rd week: Solution of wave equation in Laplace domain 4th week: Steady friction model and unsteady friction model, Propagation constant 5th week: Oscillatory laminar flow in pipe 6th week: Hydraulic impedance, reflection coefficient, and frequency response analysis 7th week: Characteristics method 8th week: Examination							
This class is opened in Self Preparation and R 毎回の講義内容を復習 Students are requested	This class is opened in alternate years, thus see the teaching schedule. Self Preparation and Review 毎回の講義内容を復習するとともに、次回の内容についてテキスト等を参考に予習してくること。						
Related subjects	1 10 19199 9401	Class and prepare on	e next class by	reauing the teaching	materiai.		
Applied Combustion En Fundamental knowledg contents.	gineering by Pro e of the fluid d	ofessor Noda: lynamics is required,	but the statistic	cs and the stochastic	cs will be lectur	ed with basic	
Fluid power engineering by Prof.Yanada: Fluid mechanics, Mechanics, Laplace transform Applied Combustion Engineering by Professor Noda: Fundamental knowledge of the fluid dynamics is required, but the statistics and the stochastics will be lectured with basic contents.							
Fluid power engineering	g by Prof.Yanada	а:					
Fluid mechanics, Mecha	anics, Laplace tr	ransform					
Notes for textbook プリント配布							
Prints will be distributed.							
Reference1	Book title	Principles of Comb	ustion		ISBN		
	Author	Kuo,K.K.	Publisher	John Wiley & Sons	Publish year		
Reference2	Book title	Fluid Transients in	Systems		ISBN		
	Author	Wylie, Streeter, Lisheng	Publisher	McGraw-Hill	Publish year		
Notes for reference							
Goals to be achieved							
Applied Combustion Er	igineering by Pro	ofessor Noda:					
Governing equations of turbulent combustion are derivable from fundamental equations.							
Governing equations of turbulent combustion are derivable from fundamental equations. フルードパワー工学(柳田): 1. フルードパワー機器の構造と特性について理解する. 2. フルードパワー機器・回路の出力や効率などが計算できる. 3. 1 次元の波動現象に対する理解を深める. 4. 水撃現象について理解する. 5. フルードパワーシステムにかかわる最近の話題について理解する. Applied Combustion Engineering by Professor Noda: Governing equations of turbulent combustion are derivable from fundamental equations.							
Fluid power engineering by Prof.Yanada:							

1.To understand structures and characteristics of fluid power components
2.To be able to calculate output and efficiency of fluid power components and systems
3.To be able to derive basic equations of fluid in pipeline
4. I o understand water/oil hammer
5.10 understand recent topics of fluid power systems
Applied Computing Engineering by Professor Node:
Evaluation is based on reports
フルードパワーT芝(柳田)・
レポート(50 占) 試験(50 占)の割合で成績を評価する
両教授の評価の平均値が最終評価となる
Applied Combustion Engineering by Professor Noda
Evaluation is based on reports
Fluid nower engineering by Prof Yanada:
Written reports:50% Examination:50%
The average mark of the two professors' evaluations is the final evaluation
A: 80 or higher (out of 100 points).
B: 65 or higher (out of 100 points).
C: 55 or higher (out of 100 points).
Examination
定期試験を実施(対面)
Examination(Face to Face)
Details of examination
電卓を必ず持参すること
Each student has to take a calculator with him/her.
Other information
Prof.Noda
Room: D411, Tel.(Ext.): 6681, e-mail: noda@me.tut.ac.jp
Prof.Yanada
Room: D309, Tel.(Ext.): 6668, e-mail: yanada@me.tut.ac.jp
Room: D411, Tel.(Ext.): 6681, e-mail: noda@me.tut.ac.jp
Prot. Yanada Deamy D200, Tel /Evet \v 6669, e-meile venede@metert es in
Room. D309, Tel.(EXL.). 0000, e-mail: yanada@me.tut.ac.jp
Prof Noda http://www.me.tut.ac.in/ece/main.en.html
Prof Yanada http://www.tut.ac.in/english/schools/faculty/me/13.html
Prof Noda http://www.me.tut.ac.in/cec/main.en.html
Prof.Yanada http://www.tut.ac.ip/english/schools/faculty/me/13.html
Office hours
Prof.Noda: Any time in afternoon
Prof.Yanada: Basically, any time is OK. The time for discussion can be determined through e-mails when Prof.Yanada is
abscent from his office.
Prof.Noda: Any time in afternoon
Prof.Yanada: Basically, any time is OK. The time for discussion can be determined through e-mails when Prof.Yanada is
abscent from his office.
Relations to attainment objectives of learning and education
(C)工学的知識の獲得とその発展的活用能力
重要な学術・技術分野の理論・応用知識を自発的に獲得し、発展的に活用できる能力
Key words

フルードパワー, 波動, 水撃, 非定常流, 振動流 Fluid power, Wave propagation, Water hammer, Unsteady flow, Oscillatory flow

(M41630380)Robotics[Robotics]

Subject	Robotics[Robotics]						
name[English]							
Schedule number	M41630380		Subject area	Advanced	Required or	Elective	
				Mechanical	elective		
Time of starting a	Fall term		Day of the	Engineering	Credit(a)	2	
course	Fail terni		week,period	F11.2 · • 2	Great(s)	2	
Faculty	Graduate Pro	ogram for Master's Deg	gree	1	Subject grade	2~	
Department Offered	Mechanical E	ngineering			Beggining	M1	
Charge teacher	内山 直樹し	JCHIYAMA Naoki			8.450		
name[Roman alphabet							
mark]							
Numbering	MEC_MAS55	025					
Objectives of class	L						
Provides fundamentals	of robotics. i.e	kinematics. dvnamic	s and motion co	ntrol of multiple rigi	d-bodies conne	cted in series	
with revolute or prismat	ic ioints.	.,, . . , . . ,					
Contents of class	j						
1. Representation and to	ransformation	of positions and orienta	ations in 3-D spa	се			
1-1. Description of posi	tions and orien	tations in 3-D space.					
1-2. Transformation of u	positions and c	rientations of rigid-obi	ects				
1-3. Properties of trans	formation mate	ix.					
2. Kinematics							
2-1. Description of relat	ive positions a	nd orientations of man	ipulator links				
2-2 Transformation of	manipulator po	sitions and orientations					
2-3. Inverse kinematics							
3 Velocities and static	forces						
3–1 Linear and rotation	al velocities of	rigid-objects					
3-2. Velocities of manip	ulator links.	ngia objecte.					
3-3. Static forces in ma	nipulators.						
4. Dynamics							
4-1. Review of rigid-boo	lv dvnamics.						
4-2. Newton-Euler and	Lagrangian for	nulations of manipulato	or dynamics.				
5. Control	0 0						
5–1. Linear control.							
5–2. Nonlinear control.							
Self Preparation and Re	view						
Read the handouts befo	re the lecture.						
Related subjects							
Fundamentals of linear a	algebra. mecha	nics and control theory	/.				
Notes for textbook	<u> </u>						
Handouts will be prepar	ed.						
Reference1	Book title	ook title Introduction to Robotics: Mechanics and Control, 3rd ISBN					
	Author	J. J. Craig	Publisher	Prentice Hall	Publish vear	2005	
Reference2	Book title	Robot Modeling and	Control		ISBN		
	Author	M W Spaper S	Dublisher	John Wilov 8	Bublich voor	2006	
	Audior	M. W. Spong, S. Hutchinson, M. Vidyasagar		Sons	F ublish year	2000	
Notes for reference							
Goals to be achieved							
Be able to derive kinematics and dynamics of robotic manipulators							
Be able to design motion controllers for robotic manipulators.							
Evaluation of achievement							
Grade will be determined only from the end-of-term exam score							
Framination							
定期試験を実施(対面)							
--							
Examination(Face to Face)							
Details of examination							
Other information							
Office: Room D-406, E-mail uchiyama@tut.jp							
Reference URL							
Office hours							
Contact the lecturer by e-mail first.							
Relations to attainment objectives of learning and education							
Key words							

(M41630400)Robot Kinematics[Robot Kinematics]

Subject	Bahat Kinam		1					
Subject	RODOT KINEM	הסטטר ההוהמוומנוטסנו הוווסווומנוטסן						
name[English]	M41600400							
Schedule number	M41630400	M41030400 Subject area Advanced Required or						
				Mechanical	elective			
T	E 111 1			Engineering	0	1		
lime of starting a course	Fall I term		Day of the week,period	Fri.2~2	Great(s)	I		
Faculty	Graduate Pro	ogram for Master's Deg	gree		Subject	1~		
Dan antra ant Official	Markania	·			grade Demoining	N41		
Department Offered	Mechanical E	ngineering			Beggining grade	MII		
Charge teacher	内山 直樹し	JCHIYAMA Naoki						
name[Roman alphabet								
mark]								
Numbering	MEC_MAS55	025						
Objectives of class								
Provides fundamental k	inematics of ro	obotic manipulators (m	ultiple rigid-bodie	es connected in ser	ies with revolut	e or prismatic		
joints).								
Contents of class								
1. Representation and t	ransformation of	of positions and orienta	ations in 3-D spa	ce				
1–1. Description of posi	tions and orien	tations in 3-D space						
1–2. Transformation of	positions and o	rientations of rigid-obi	ects.					
1-3 Properties of trans	formation matr	ix						
2 Kinematics								
2–1 Description of relat	tive positions a	nd orientations of man	inulator links					
2-7. Description of relation	manipulator po	sitions and orientations						
2-3 Inverse kinematics								
2-3. Inverse kinematics.	fawa a a							
3. Velocities and static		and and a state state						
3-1. Linear and rotation	al velocities of	rigia-objects.						
3-2. Velocities of manip	ulator links.							
3-3. Static forces in ma	inipulators.							
	-							
Self Preparation and Re	oview							
Read the handouts befo	re the lecture.							
Related subjects								
Fundamentals of linear	algebra and me	chanics.						
Notes for textbook								
Handouts will be prepar	ed.							
Reference1	Book title	Introduction to Rob Edition	otics: Mechanics	and Control, 3rd	ISBN			
	Author	J. J. Craig	Publisher	Prentice Hall	Publish year	2005		
Reference2	Book title	Robot Modeling and	Control	•	ISBN			
	Author	M W Spong S	Dublisher	John Wiley &	Dublich vear	2006		
		Hutchinson M		Sons	i ubiisti yodf	2000		
		Vidvasagar		0013				
Notes for reference	I	, layasagai	I	I				
Goals to be achieved								
Be able to derive kinem	atics of robotic	e manipulators.						
Evaluation of achievement								
Grade will be determine	d only from the	e end-of-term exam so	ore.					
Examination								
定期試験を実施(対面)								
Examination(Face to Fa	ce)							
Details of examination	•							
Other information								

Office: Room D-406, E-mail uchiyama@tut.jp Reference URL

Office hours

Contact the lecturer by e-mail first.

Relations to attainment objectives of learning and education

Key words

(M41630450)Fluid Power Engineering[Fluid Power Engineering] Fluid Power Engineering[Fluid Power Engineering] Subject name[English] Schedule number M41630450 Required Elective Advanced Subject area Mechanical or elective Engineering Day of the Credit(s) Time of starting a Fall1 term Mon $1 \sim 1$ 1 week,period course Faculty Graduate Program for Master's Degree Subject 1~ grade Department Mechanical Engineering Beggining M1 Offered grade 柳田 秀記 YANADA Hideki Charge teacher name[Roman alphabet mark] MEC MAS56025 Numbering **Objectives of class** 加圧した流体(油, 空気, 水など)を利用して機械的な仕事を取り出すシステムであるフルードパワー機器・システムに関して, 基 礎的事項,機器を接続する管路内流体の動特性,フルードパワーに関する最近のトピックスについて講義する. Fluid power systems utilize pressurized fluid (oil, air, water) to transfer power and output mechanical power through fluid power actuators. In this class, students acquire knowledge of structures and theories of fluid power components and systems as well as dynamics of fluid in pipelines. In addition, students acquire information on recent topics of fluid power engineering. Contents of class 1週目:フルードパワーシステムの概要 2週目:各種機器の基礎理論 3週目:機器および回路の効率 4週目:管路の動特性(一次元波動方程式) 5周目:管路の動特性(一次元波動方程式の解,水撃現象) 6周目:管路の動特性(非定常層流,周波数応答) 7週目:フルードパワーに関する最近の話題 8週目:フルードパワーに関する最近の話題(45分), 試験(45分) 1st week:Introduction to fluid power systems 2nd week:Strutures and theories of fluid power componets 3rd week:Power loss and efficiencies of fluid power systems 4th week:Dynamics of fluid in pipeline (derivation of one-dimensional wave equation) 5th week:Dynamics of fluid in pipeline (solution of wace equation, water/oil hammer) 6th week:Dynamics of fluid in pipeline (unsteady laminar flow, frequency response) 7th week:Recent topics of fluid power systems 8th week:Recent topics of fluid power systems (45 min) and examination (45 min) Self Preparation and Review 毎回の講義内容を復習するとともに、次回の内容についてテキスト等を参考に予習してくること。 Students are requested to review each class and prepare the next class by reading the prnted teaching material. **Related** subjects 数学(複素関数、ラプラス変換)、流体力学 Fluid mechanics, Mathematics (complex variables, Laplace transform) Notes for textbook プリント配布 Printed teaching materials are given. Reference1 Book title Fluid Transients ISBN Author Wylie/Streeter/Lisheng McGraw-Hill Publish Publisher vear Notes for reference Goals to be achieved 1. フルードパワー機器の構造と特性について理解する. 2. フルードパワー機器・回路の出力や効率などが計算できる. 1次元の波動現象に対する理解を深める.

4 水撃現象について理解する
5 フルードパワーシステムにかかわる最近の話題について理解する
1 To understand structures and share staristics of fluid source components
1. To understand structures and characteristics of huid power components
2. To be able to calculate output and enciency of huid power components and systems
3. To be able to derive basic equations of fluid in pipeline
4. Io understand water/ oil nammer
3. To understand recent topics of fluid power systems
Evaluation of achievement
レホート(50 点), 試験(50 点)の割合で成績を評価する.
評価点が 55 点以上の場合を合格(達成目標に到達した)とし, 得点によって達成の程度を以下のように明示する.
評価 A:80 点以上
評価 B∶65~79 点
評価 C:55~64 点
Each student's achievement is evaulated by the sum of examination (50%) and reports (50%).
Students will be evaluated as follows:
A: Obtained total points of exam and reports, 80 or higher (out of 100 points).
B: Obtained total points of exam and reports, 65 or higher (out of 100 points).
C: Obtained total points of exam and reports, 55 or higher (out of 100 points).
Examination
Examination(Face to Face)
Datalis of avamination
$E_{ach} \in \mathcal{D}^{-1}$ (1) $\mathcal{D}^{-1} \in \mathcal{D}^{-1}$
Ather information
Curier Innormation
活音・D-309、電話・44 - 6660、e=nial.yanda@ment.ut.acjp
e-mail にて相談時間を打ち合わせる。
The date and time are arranged by e-mail.
Relations to attainment objectives of learning and education
(C)工学的知識の獲得とその発展的活用能力
(シーナ) オンガーン (シーマン) (シー
Key words
フルードパワー, 波動, 水撃, 非定常流, 振動流
Fluid power, Wave propagation, Water hammer, Unsteady flow, Oscillatory flow

(M41630460)Advances in Systems, Control and Robotics[Advances in Systems, Control and Robotics]

Subject	Advances in Systems, Control and Robotics[Advances in Systems, Control and Robotics]					
name[English]			I	1	1	
Schedule number	M41630460		Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Fall2+Spring		Day of the week,period	Tue.2~2	Credit(s)	2
Faculty	Graduate Pro	ogram for Master's De	egree		Subject grade	2~
Department Offered	Mechanical E	ngineering			Beggining grade	M1
Charge teacher	章 忠,内山	直樹 SHO Tadashi, I	UCHIYAMA Naoki		•	
name[Roman						
alphabet mark]		005				
Numbering	MEC_MAS55	025				
Objectives of class		6				
To obtain advanced kno	owledge of tim	e-frequency analysis	and image proces	sing by utilizing way	/elet transform.	
To learn fundamentals	s of mathema	tical programming th	hat is typically e	employed for the	management o	f industries and
enterprises.						
Contents of class						
First half:						
1. Basic theory of time	-frequency and	alysis method will be l	briefly discussed.			
1)Shot-Time Fourier tr	ansform					
2)The Wigner-Ville Dist	ribution					
3)Hilbert Transform and	d instantaneou	s frequency analysis				
4)Wavelet transform						
2.Application of the way	velet Transfor	n will be briefly discus	ssed.			
1) Time series signal ar	nalysis					
2) Image processing						
3) Abnormal detection						
4) Surface inspection						
Last half:						
1st week: Fundamental	s of mathemat	ical programming				
2nd week: Fundamenta	ls of linear pro	gramming				
3rd week: Simplex algor	rithm I					
4th week: Simplex algor	rithm II					
5th week: Fundamental	s of nonlinear	programming				
oth week: Gradient met	nod	had				
8th week: Summary and	d final examina	tion				
our week. Ourmary and						
Solf Properation and P	o dow					
Bequired to prepare for	eview	ob lactura contente l	bacad on bandout	6		
Required to prepare for and review each lecture contents based on handouts.						
Basic knowledge of the	signal analysi					
Buolo Informedge of the						
Calculus and Linear algebra						
Notes for textbook						
Handouts will be perpar	red by lecturer	S.				
					•	
Reference1	Book title	Frontiers in comput	ting technologies	for Manufacturing	ISBN	
		applications				

Reference2 Book title Wavelets and analysis ISBN Reference3 Book title Time-Frequency Analysis Feblisher Publish Reference4 Book title Time-Frequency Analysis ISBN ISBN Reference4 Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070080201 Reference4 Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070080201 Notes for reference Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070080201 Notes for reference Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070080201 Notes for reference Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070080201 Notes for reference Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070080201 Notes for reference Understand fundamentals of mathematical programming. Expected to understand fundamentals of nonlinear programming. Expected to understand fundamentals of nonlinear programming. Expected to understand fundamentals of nonlinear programming. <th></th> <th>Author</th> <th>Y. Shimizu , Z. Zhang, R. Batres</th> <th>Publisher</th> <th>Springer</th> <th>Publish year</th> <th>2007</th>		Author	Y. Shimizu , Z. Zhang, R. Batres	Publisher	Springer	Publish year	2007	
Author M. Holschneider Publisher Oxford University Publish year Reference3 Book title Time-Frequency Analysis IEEE Press Publish year Reference4 Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070030201 Author Richard Bronson Publisher McGraw-Hill Education Publish 978- 0070030201 Notes for reference Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070030201 Notes for reference Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070030201 Notes for reference Goals to be achieved McGraw-Hill Publish 1997 Notes for reference Expected to understand fundamentals of nonlinear programming. Expected to understand fundamentals of nonlinear programming. Expected to understand fundamentals of nonlinear programming. Expected to understand fundamentals of nonlinear programming. Expected Sciences to Science	Reference2	Book title	Wavelets and analysi	is	-	ISBN		
Reference3 Book title Time-Frequency Analysis University Press Year IsBN Reference4 Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070080201 Author Richard Bronson Publisher IEEE Press Publish 978- 0070080201 Notes for reference4 Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070080201 Notes for reference Moder at home of the time-frequency analysis method and using them in real application Expected to understand fundamentals of mathematical programming. Expected to understand fundamentals of nonlinear programming. Expected to understand fundamentals of nonlinear programming. Expected to understand fundamentals of nonlinear programming. Evaluation of achievement Fresh hift. Interim report (50%) and term-end report (50%) Last hiff: The grade will be determined by the end-of-term examination is 55% or over. Grade levels are 0 (55% - less than 80%) and A (80% or over). Examination Evaluation of achievement Evaluation of achievement Evaluation achievement Evaluation achievement Other Detainformation Evaluation achievement Evaluation achievement Evaluation achievement		Author	M. Holschneider	Publisher	Oxford	Publish		
Press Press Issen Reference3 Book title Time-Frequency Analysis ISSEN Image: Second Se					University	year		
Prevenues Dook title Title-Trequency Analysis Listify Reference4 Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070080201 Author Richard Bronson Publisher McGraw-Hill Publish 1997 Notes for reference Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070080201 Notes for reference Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070080201 Notes for reference Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070080201 Understand fundamentals of mathematical programming. Expected to understand fundamentals of monlinear programming. Expected to understand fundamentals of nonlinear programming. Expected Schaum's Operations Research 0100 %). Expected to understand fundamentals of contentiar programming. Expected Schaum's Operations Research 0100 %). Expected Schaum's Operations Schaum's Operation Schaum's Operation Schaum's Operation Expected to understand fundamentals of contentiar programming. Expected Schaum's Operation Schau	Deferrere	Deals this	Time For A		Press	ICDN		
Author R.L. Allen, D.W. Publisher IEEE Press Publish year Reference4 Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070080201 Author Richard Bronson Publisher McGraw-Hill Education Publish year 1997 Notes for reference Coals to be achieved McGraw-Hill Education Publisher McGraw-Hill Education Publish year Understand fundamentals of mathematical programming. Expected to understand fundamentals of nonlinear programming. Expected to understand fundamentals of nonlinear programming. Expected to understand fundamentals of nonlinear programming. Evaluation of achievement. Evaluation of achievement fundamentals of nonlinear programming. Evaluation of achievement fundamentals of nonlinear programming. Evaluation of achievement fundamentals of nonlinear programming. Evaluation of achievement fundamentals of nonlinear programming. Evaluation of achievement fundamentals of nonlinear programming. Evaluation of achievement fundamentals of nonlinear programming. Evaluation of achievement fundamentals of nonlinear programming. Evaluation of achievement fundamentals of nonlinear programming. Evaluation son over. Evaluation son over. Test haff. Therigrade will be determined by	Reference3	Book title	Time-Frequency Ana	alysis		ISBN		
Reference4 Book title Schaum's Outline of Operations Research 2nd Edition ISBN 978- 0070080201 Author Richard Bronson Publisher McGraw-Hill Education Publish year 1997 Notes for reference Cals to be achieved Understanding the knowledge of the time-frequency analysis method and using them in real application Expected to understand fundamentals of mathematical programming. Expected to understand fundamentals of nonlinear programming. Expected to understand fundamentals of nonlinear programming. Evaluation of achievement Evaluation of achievement Evaluation of achievement First half. Interim report (50%) and term-end report (50%) Last half. Evaluation of achievement Evaluation of achievement Evaluation of achievement & Colta the is core is given if the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%), B (65 - less than 80%) and A (80% or over). Evaluation of achievement Evaluation of achievement & Other Details of samination Evaluation of achievement Evaluation achievement Evaluationa		Author	R.L. Allen, D.W. Mills	Publisher	IEEE Press	Publish year		
Author Richard Bronson Publisher McGraw-Hill Education Publish Wear 1997 Notes for reference Coals to be achieved Understanding the knowledge of the time-frequency analysis method and using them in real application Expected to understand fundamentals of mathematical programming. Expected to understand the theory of the simplex method. Expected to understand fundamentals of nonlinear programming. Evaluation of achievement First half: Interim report (50%) and term-end report (50%) Image: Coal Coal Coal Coal Coal Coal Coal Coal	Reference4	Book title	Schaum's Outline of	Operations Res	search 2nd Edition	ISBN	978- 0070080201	
Notes for reference Casis to be achieved Understanding the knowledge of the time-frequency analysis method and using them in real application Expected to understand fundamentals of mathematical programming. Expected to understand fundamentals of nonlinear programming. Evaluation of achievement First haff: Interim report (50%) and term-end report (50%) Last half: The grade will be determined by the end-of-term examination score only (100 %). The oredit of this course is given if the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%). B (65 - less than 80%) and A (80% or over). Examination Cofter Data of commination Start half: Report Last half: End-of-term examination Other information Porter information Core information Core information Porter information Coffice hours Contact the lecturer by e-mail first. Reference URL http://ismetut.ac.jp Coffice hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education		Author	Richard Bronson	Publisher	McGraw-Hill Education	Publish year	1997	
Goals to be achieved Understanding the knowledge of the time-frequency analysis method and using them in real application Expected to understand fundamentals of mathematical programming. Expected to understand the theory of the simplex method. Expected to understand fundamentals of nonlinear programming. Evaluation of achievement First haff: Interim report (50%) and term-end report (50%) Last half: The grade will be determined by the end-of-term examination score only (100 %). The credit of this course is given if the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%). B (65 - less than 80%) and A (80% or over). Examination ₹ Ø ft Other Details of examination First haff: Report Last half: End-of-term examination Other information Room: D=610, E-mail: ushiyama@me.tut.ac.jp E-mail: ushiyama@me.tut.ac.jp Office hours Ontact the lecturer by e-mail first. Reletions to attainment objectives of learning and education	Notes for reference							
Understanding the knowledge of the time-frequency analysis method and using them in real application Expected to understand fundamentals of mathematical programming. Expected to understand fundamentals of nonlinear programming. Evaluation of achievement First haff: Interim report (50%) and term-end report (50%) Last half: The grade will be determined by the end-of-term examination score only (100 %). The credit of this course is given if the score of the above examination is 55% or over. Grade levels are 0 (55% – less than 65%), B (65 – less than 80%) and A (80% or over). Examination Examination Examination Examination Details of examination Details of examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Defails of examination Details the lecturer by e-mail first. Reference URL http://sme.tut.ac.jp Defails the lecturer by e-mail first. Reletions to attainment objectives of learning and education Key words	Goals to be achieved							
Expected to understand fundamentals of mathematical programming. Expected to understand the theory of the simplex method. Expected to understand fundamentals of nonlinear programming. Evaluation of achievement First half: Interim report (50%) and term-end report (50%) Last half: The grade will be determined by the end-of-term examination score only (100 %). The credit of this course is given if the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%), B (65 - less than 80%) and A (80% or over). Examination Context of the examination Context of examination First half: Report Last half: Report Last half: End-of-term examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Context the lecturer by e-mail first. Relations to attainment objectives of learning and education	Understanding the know	wledge of the t	time-frequency analysi	is method and ι	ising them in real app	olication		
Expected to understand fundamentals of mathematical programming. Expected to understand fundamentals of nonlinear programming. Evaluation of achievement First half: Interim report (50%) and term-end report (50%) Last half: The grade will be determined by the end-of-term examination score only (100 %). The credit of this course is given if the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%), B (65 - less than 80%) and A (80% or over). Examination Context Context Details of examination First half: End-of-term examination Other information Reference URL http://is.me.tut.ac.jp Context the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words								
Expected to understand the theory of the simplex method. Expected to understand fundamentals of nonlinear programming. Evaluation of achievement First half: Interim report (50%) and term-end report (50%) Last half: The grade will be determined by the end-of-term examination score only (100 %). The credit of this course is given if the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%), B (65 - less than 80%) and A (80% or over). Examination #Onther Details of examination First half: End-of-term examination Other Details of examination First half: End-of-term examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Office hours Contact the lecture by e-mail first. Relations to attainment objectives of learning and education	Expected to understan	d fundamental	s of mathematical prog	gramming.				
Explosition of achievement First half: The grade will be determined by the end-of-term examination score only (100 %). The credit of this course is given if the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%), B (65 - less than 80%) and A (80% or over). Examination # CO fth Other Details of examination First half: Report Last half: End-of-term examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education	Expected to understan	d the theory o	t the simplex method.	mina				
First half: Interim report (50%) and term-end report (50%) Last half: The grade will be determined by the end-of-term examination score only (100 %). The credit of this course is given if the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%), B (65 - less than 80%) and A (80% or over). Examination その他 Other Details of examination First half: Report Last half: End-of-term examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education	Evaluation of achieven	nent	s of nonlinear program	iiiiig.				
Last half: The grade will be determined by the end-of-term examination score only (100 %). The credit of this course is given if the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%), B (65 - less than 80%) and A (80% or over). Examination Examination Examination E contained for the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%), B (65 - less than 80%) and A (80% or over). Examination E contained for the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%), B (65 - less than 80%) and A (80% or over). Examination E contained for the score of the above examination E contact the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words	First half: Interim repor	rt (50%) and te	rm-end report (50%)					
Last half: The grade will be determined by the end-of-term examination score only (100 %). The credit of this course is given if the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%), B (65 - less than 80%) and A (80% or over). Examination ₹0/the Other Details of examination First half: Report Last half: End-of-term examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words								
The grade will be determined by the end-of-term examination score only (100 %). The credit of this course is given if the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%), B (65 - less than 80%) and A (80% or over). Examination その他 Other Details of examination First half: Report Last half: End-of-term examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words	Last half:							
The credit of this course is given if the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%), B (65 - less than 80%) and A (80% or over). Examination その他 Other Details of examination First half: Report Last half: End-of-term examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education	The grade will be deter	mined by the e	end-of-term examination	on score only (100 %).			
The credit of this course is given if the score of the above examination is 55% or over. Grade levels are C (55% - less than 65%), B (65 - less than 80%) and A (80% or over). Examination その他 Other Details of examination First half: Report Last half: End-of-term examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words								
Conduct events and O (05) Tess than 00%, B (05) Tess than 00% and A (00% 01 over). Examination その性 Other Details of examination First half: Report Last half: End-of-term examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words	The credit of this cours	se is given if ti % – less than 6	The score of the above $(5\%) = 8(65 - 1655 + 1655)$	examination is	55% or over.			
その性 Other Details of examination First half: Report Last half: End-of-term examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education	Examination							
Other Details of examination First half: Report Last half: End-of-term examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education	その他							
Details of examination First half: Report Last half: End-of-term examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education	Other							
First half: Report Last half: End-of-term examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words	Details of examination							
Last half: End-of-term examination Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words	First half: Report							
Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words	l ast half: End-of-term	examination						
Other information Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education								
Room: D-610, E-mail: zhang@me.tut.ac.jp E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words	Other information							
E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words	Room: D−610, E−mail: z	zhang@me.tut.a	ac.jp					
E-mail: uchiyama@me.tut.ac.jp Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words								
Reference URL http://is.me.tut.ac.jp Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words	E-mail: uchiyama@me.t	ut.ac.jp						
Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words								
Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education Key words	ntup.//is.me.tuc.ac.jp							
Relations to attainment objectives of learning and education Key words	Contact the lecturer by e-mail first.							
Key words	Relations to attainment objectives of learning and education							
Key words								
Key words								
Key words								
Key words								
	Key words							
Wavelet transform, Time-frequency analysis, Mathematical Programming, Linear Programming, Nonlinear Programming	Wavelet transform, Tim	ne-frequency a	nalysis, Mathematical I	Programming, L	inear Programming, I	Nonlinear Prog	gramming	
	Key words							
Wavelet transform, Time-frequency analysis, Mathematical Programming, Linear Programming, Nonlinear Programming	Wavelet transform, Tim	ne-frequency a	nalysis, Mathematical I	Programming, L	inear Programming, I	Nonlinear Prog	gramming	

(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 Elec	ctronic Information	Engineering]	1		
Schedule number	M42610020	Subject area	Advanced	Required or	Required	
			Electrical and	elective		
			Electronic			
			Information			
			Engineering	• ·		
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6	
Faculty	Graduate Program	n for Master's Degre	ee	Subject grade	1~2	
Department Offered	Electrical and Elec	ctronic Information	Engineering	Beggining grade	M2	
Charge teacher name[Roman	S2系教務委員 2k	kei kvomu Iin-S		grado		
alphabet mark]		5				
Numbering						
Objectives of class						
The thesis research aims to prov	vide a practical exp	erience of researcl	h work, and to acqu	ire his/her researd	ch skill with deep	
understanding of the electrical an	nd electronic information	ation engineering.				
Contents of class						
The research subject depends o	n the supervisor an	d the research gro	up you belong to. E	every student will h	nave an individual	
research subject. For more detail	s, please contact w	ith your supervisor.				
Self Preparation and Review						
Polotod auticate						
Related subjects						
Notes for textbook						
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 present	ation.			
Evaluation of achievement						
Presentation, Thesis, Coursework	k, and Outcomes are	e evaluated generall	у.			
Examination						
None during exam period						
Details of examination						
Other information						
Reference URL						
Office hours						
Relations to attainment objectives of learning and education						
-						
Key words						

(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 Electronic Information Engineering]							
Schedule number	M42610020	M42610020 Subject area Advanced Required or Required						
			Electrical and	elective				
			Electronic					
			Information					
Time of starting a course	2Years	Day of the	Intensive	Credit(s)	6			
THIS VI Starting a VUISO		week,period			Ŭ			
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	1~1			
Department Offered	Electrical and Ele	ctronic Information	Engineering	Beggining	M2			
Charge teacher name[Roman	S2系数務委員 2	2系各数昌 2kei kvoi	mu lin-S. 2kei kakuk	grade				
alphabet mark]				youn				
Numbering	ELC_MAS51025							
Objectives of class								
The thesis research aims to pro-	vide a practical exp	perience of research	n work, and to acqu	iire his/her researd	ch skill with deep			
understanding of the electrical ar	nd electronic inform	ation engineering.						
Contents of class								
The research subject depends o	n the supervisor ar	nd the research gro	up you belong to. E	very student will h	nave an individual			
research subject. For more detail	s, please contact w	ith your supervisor.						
Self Preparation and Review								
Deleted auk!t-								
Kelated subjects								
Nata a fau tardh a di								
Notes for textbook	ailabla from the our	ondoor						
Notes for reference		Jervisor.						
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.					
Evaluation of achievement								
Presentation, Thesis, Coursework	, and Outcomes ar	e evaluated generall	у.					
試験 期間 中に は 何 も 行わない								
None during exam period								
Sound of GranniauUII								
Other information								
Reference URL								
Office hours								
Relations to attainment objectives of learning and education								
1/ 1								
Key words								

(M4261002T)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 Electronic Information Engineering]					
Schedule number	M4261002T	Subject area	Advanced	Required or	Required	
			Electrical and	elective		
			Electronic			
			Information			
			Engineering			
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6	
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	2~2	
Department Offered	Electrical and Elec	ctronic Information	Engineering	Beggining grade	M2	
Charge teacher name[Roman	S2系教務委員 2	系各教員 2kei kvor	mu lin−S. 2kei kakuk	vouin		
alphabet mark]				.,		
Numbering	ELC_MAS51015					
Objectives of class						
The thesis research aims to prov	vide a practical exp	erience of research	work and to acqu	uire his/her researd	ch skill with deep	
understanding of the electrical an	d electronic information	ation engineering.				
Contents of class						
The research subject depends of	n the supervisor an	d the research gro	up you belong to. E	very student will h	nave an individual	
research subject. For more detail	s, please contact w	ith your supervisor.				
Self Preparation and Review						
Related subjects						
Notes for textbook						
Reference and material will be av	ailable from the sup	ervisor.				
Notes for reference						
Coole to be estimat						
To get comething new on individu	al uaaaauah fialda					
To get something new on individu	ai research heids.	ne and the pressure				
To develop his/her research skill	including the planni	ng and the presenta	ation.			
Presentation, Thesis, Coursework	, and Outcomes are	e evaluated generall	у.			
試験期间中には何も行わない						
None during exam period						
Details of examination						
Other information						
Reference URL						
Office hours						
Relations to attainment objectives of learning and education						
Key words						

(M42610040)Seminar on Electrical and Electronic Information Engineering[Seminar on Electrical and Electronic Information Engineering]

Subject name[English]	Seminar on Electrical and Electronic Information Engineering[Seminar on Electrical and							
	Electronic Information Engineering]							
Schedule number	M42610040	M42610040 Subject area Advanced Required or Required						
			Electrical and	elective				
			Electronic					
			Engineering					
Time of starting a course	Year	Day of the	Intensive	Credit(s)	6			
		week,period						
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	2~			
Department Offered	Electrical and Ele	ctronic Information	Engineering	Beggining grade	M1			
Charge teacher name[Roman	S2系教務委員 2I	kei kyomu Iin−S						
alphabet mark	ELC MASS1015							
	ELC_MA351015							
The seminar aims to provide a h	road understanding	of theoretical and	experimental appro	oches related to t	he electrical and			
electronic information engineering	g for the research w	ork of his/her mast	er thesis.					
Contents of class	5							
The class provides both of funda	mental knowledge o	n the research worl	of master thesis a	nd the most advand	ced results in the			
related field by reading research	papers and monogra	aphs. Contents of t	ne class depend on	the supervisor. To	be announced by			
individual supervisors.								
Self Preparation and Review								
Related subjects								
Notes for textbook		·						
l extbook or material will be made	e available from the	supervisor. To be a	nnounced by individ	ual supervisors.				
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 the present	ation skill.				
Evaluation of achievement								
Coursework, presentation and/or	report.							
Examination 試験期間内には何も行わたい								
武殿労间中には何も1147ない None during exam period								
Details of examination								
Other information								
Reference URL								
Office hours								
Relations to attainment objectives of learning and education								
Key words								
					-			

 (M42610050)Seminar on Electrical and Electronic Information Engineering 1A[Seminar on Electrical and Electronic Information Engineering 1A]

Subject name[English]	Seminar on Electrical and Electronic Information Engineering 1A[Seminar on Electrical and					
	Electronic Information Engineering 1A]					
Schedule number	M42610050	Subject area	Advanced	Required or	Required	
			Electrical and	elective		
			Electronic			
			Information			
			Engineering			
Time of starting a course	Year	Day of the	Intensive	Credit(s)	4	
		week,period			1	
Faculty	Graduate Program	tor Master's Degre		Subject grade	~ 	
Department Offered	Electrical and Elec	ctronic information	Engineering	grade		
Charge teacher name[Roman	S2系教務委員 2k	kei kvomu lin-S		Biado		
alphabet mark]		···· , ····· -				
Numbering	ELC_MAS51015					
Objectives of class						
The seminar aims to provide a b	road understanding	of theoretical and	experimental appro	aches related to t	he electrical and	
electronic information engineering	g for the research w	, vork of his∕her mast	ter thesis.			
Contents of class						
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 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. To be a	nnounced by individ	ual supervisors.		
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 the present	ation skill.		
Evaluation of achievement						
Coursework, presentation and/or	report.					
Examination						
試験期間中には何も行わない						
None during exam period						
Details of examination						
Other information						
Reference URL						
Office hours						
Relations to attainment objectives of learning and education						
Key words						

(M42610060)Seminar on Electrical and Electronic Information Engineering 1B[Seminar on Electrical and Electronic Information Engineering 1B]

Subject name[English]	Seminar on Electrical and Electronic, Information Engineering 18[Seminar on Electrical and						
	Electronic Information Engineering 18]						
Sebedule number	M42610060	M2610060 Subject area Advanced Deguired or Deguired					
	10142010000	Subject al ca	Flectrical and	olective	Nequireu		
			Electrical and	8186048			
			Liectronic				
			Engine agring				
T C L L	V		Engineering	0 11/)	0		
lime of starting a course	Year	Day of the	Intensive	Great(s)	Z		
Provide a	Que du et a Due mare	week,period		0.11	0		
	Graduate Program	n for Master's Degre		Subject grade	Z~ ₩1		
Department Offered	Electrical and Ele	ctronic information	Engineering	Deggining			
Observed to a base of Damage	00 云	Lai la construction C		grade			
	32术软伤安良 2	kei kyömu im-3					
	ELC_IMASSIUIS						
Objectives of class							
The seminar aims to provide a b	road understanding	g of theoretical and	experimental appro	oches related to t	he electrical and		
electronic information engineering	g for the research w	vork of his/her mast	ter thesis.				
Contents of class							
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	ne class depend on	the supervisor. To	be announced by		
individual supervisors.							
Self Preparation and Review							
Related subjects							
Notes for textbook							
Toythook or material will be made	available from the	aunaminar Tahaa	nnounced by individ	ual aunorationro			
Textbook of material will be made	available from the	supervisor. To be a	nnounced by individ	ual supervisors.			
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 the present	ation skill.			
Evaluation of achievement							
Coursework, presentation and/or	report.						
Examination							
試験期間中には何も行わない							
None during exam period							
Details of examination							
Other information							
Deferrer et UDI							
Office hours							
Relations to attainment objective	s of learning and e	ducation					
_	-						
Key words							
-							

(M42630100)Methodology of R & D 1[Methodology of R & D 1]

Subject name(Englini) Metrosology of R & D (Metrosology of R & D								
Schedule number MM2.0301UU Subject area Advanced Required or Electrice Time of starting a course Fail term Dev of the weekperiod Telestronic Telestronic Subject area Advanced Electrice Subject area Subject area Subject area Fail term Dev of the weekperiod Telestronic information Electrice Subject area Telestronic information Telestronic information Electrice Subject area Telestronic information Telestronis information Telestronic informatio		wethodology of R	A D ILWiethodology		<u> </u>			
Image: Control of the starting a course Fall term Day of the president of the starting a course Fall term Day of the president of the starting a course Fall term Day of the president of the starting a course Credit(a) 2 Faculty Graduate Program for Master's Degree Subject grade 1~ Department Offered Electrical and Electronic Information Engineering Beggining M1 Charge teacher name(Roman a) ophabet mark] ELC.MAS58025 Subject grade 1~ Department Offered ELC.MAS58025 Subject grade 1 Subject grade Objectives of class The class provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. Contents of the class Immediate and Electronic information to grade The class provides some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Self Progradian and Review Reference and and communicating outcomes. Related subjects Notes for reference Goals to be achieved Reference and and communicating outcomes. Coursework and presentation are evaluated generally. Examination Self program proid Self program p	Schedule number	M42630100	Subject area	Advanced	Required or	Elective		
Image: Contract of the second seco				Electrical and	elective			
Information Information Information Time of starting a course Fail term Day of the veckpoint Tue.3~3 Oredit(a) 2 Faculty Graduate Program for Master's Dagree Subject grade 1~ Department Offered Electrical and Electronic Information Engineering Beggining M1 Charge teacher name[Roman alphabet mark] ELC_MASS8025 Statistical and electronic information engineering for the research work of his/her master thesis. Statistical and electronic information engineering for the research work of his/her master thesis. Contents of class The class provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. The class provide some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors. Soff Proparation and Review Reference and and meterial will be available from the supervisor. Notes for reference Gaala to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Related subjects Statistical and electronic information Notes for reference Gaala to be achieved Statististical and formulati				Electronic				
Image of starting a course Fail term Day of the Tue3~3 Credit(a) 2 Faculty Graduate Program for Master's Degree Subject grade 1~ Department Offered Electrical and Electronic Information Engineering Beggining grade M1 Charge teacher name[Roman alphabet mark] S2系数務委員 2kei kyonu lin~S M1 master Numbering ELC_MASS8025 Electrical and electronic information engineering for the research work of his/her master thesis. M1 master Cortants of class The class aims to provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. Gortants of class The class depend on the supervisor. To be announced by individual supervisors Self Proparation and Review Related subjects Related subjects Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and presentation are evaluated generally. Cursework and presentation are evaluated generally. Examination Goals to be achieved Coursework and presentation are evaluated generally. Coursework and presentation are evaluated generally. Examination				Information				
Time of starting a course Fail term Day of the week,ported Tue 3~3 Credit(a) 2 Faculty Graduate Program for Master's Dagree Subject grade 1~ Department Offered Electrical and Electronic Information Engineering Beggining M1 Charge teacher name[Roman alphabet matk] SZ系教務委員 2kei kyomu lin-S Beggining M1 Numbering ELC_MASS8025 Using the starting and the starting of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. The class alims to provide a basic understanding of R&D methodology related to the class depend on the supervisor. The class alims to provide a basic understanding of R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Self Proparation and Review Reference and material will be available from the supervisor. Notes for reference Roals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshouting and communicating outcomes. Evaluation of subarvement Coursework and presentation are evaluated generally. Evaluation of examination SubgRRM prict/da/da/da/da/da/da/da/da/da/da/da/da/da/				Engineering				
Image Space Subject grade Image Space Department Offered Electrical and Electronic Information Engineering Beggining M1 Oharge teacher name[Roman alphabet mark] S2系教務委員 2kei kyomu lin-S Beggining M1 Numbering ELC.MASS8025 Subject grade Not Objectives of class The class alms to provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. Contents of class The class alms to provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. Soft Preparation and electronic information Soft Preparation and Review Related subjects Soft Preparation and Review Soft Preparation and Review Related subjects Soft Preparation and material will be available from the supervisor. Notes for reforence Soft Preparation and implementing specific research tasks. To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks. Soft Preparation are evaluated generally. Software, Softwar	Time of starting a course	Fall term	Day of the	Tue.3~3	Credit(s)	2		
Faculty Circaduate Program for Master's Degree Subject and 1~ Department Offered Electrical and Electronic Information Engineering Beggining grade M1 Charge teacher name[Roman alphabet mark] S2系教務委員 2kai kyomu lin-S alphabet mark] M1 Image in the second information Engineering M1 Numbering ELC_MAS58025 Image information Engineering M1 Image information Objectives of class The class aims to provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. Image information information Contents of class The class provides some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Solf Proparation and Review Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of factorycouv Stability of the factorycouv None during exam peried Image in the supervisor. Details of examination Stability of identifying and education <th></th> <th></th> <th>week,period</th> <th></th> <th></th> <th></th>			week,period					
Department Offered Electrical and Electronic Information Engineering Beggining grade M1 Charge teacher name[Roman alphabet mark] S2系教務委員 2kei kyomu lin-S Note information Note information Mumbering ELC_MASS8025 ELC_MASS8025 Note information engineering for the research work of his/her master thesis. Contents of class The class almot to provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. Set Frequencies of class depend on the supervisor. Contents of class The class almot to provide some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Self Preparation and Review Reference and material will be available from the supervisor. Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks. Touleshooting and communicating outcomes. Evaluation of achievement Evaluation of achievement Coursework and presentation are evaluated generally. Evaluation Details of examination Evaluation Communication Details of examination Contents to attainment objectives of	Faculty	Graduate Progran	n for Master's Degre	e	Subject grade	1~		
grade grade Alphabet mark] S2条教務委員 2kei kyomu lin-S Siphabet mark] ELC_MASS8025 Objectives of class The class aims to provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. Contents of class The class provides some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Self Preparation and Review Related aubjecta Related aubjecta Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Set annunced main are evaluated generally. Datains to farse and material will be approximated agenerally. Set annunced main and presentation are evaluated generally. Evaluation of achievement Set annunced main period Set annunced main annunced main and electronic information Conserverk and presentation are evaluated generally. Set annunced main period Set annunced main annunc	Department Offered	Electrical and Ele	ctronic Information	Engineering	Beggining	M1		
Charge teacher nameRoman S2条数務委員 2kei kyomu lin-S Anumbering ELC.MAS58025 Objectives of class The class aims to provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. Contents of class The class aims to provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. Contents of class The class aims to provide some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Self Preparation and Review Related subjects Related subjects Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks. troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination Detail of achievement Dotail of examination Detail of examination Details of achievement Coursework and presentation are evaluated generally. Examination Contents of examination Detail of examination					grade			
alphabet mark] ELC_MASS8025 Objectives of class ELC_MASS8025 The class provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. Image: Contents of class Contents of class The class provides some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Self Preparation and Review Related subjects Related subjects Self Preparation and Review Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks. troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Coursework and presentation Self Preparation Details of example None during example Other information Reference URL Office hours Relations to attainment objectives of learning and education	Charge teacher name[Roman	S2系教務委員 2	kei kyomu Iin−S					
Numbering ELC_MASS8025 Objectives of class The class aims to provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. Contents of class The class provides some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Self Preparation and Review Related subjects Notes for textbook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination Bit®期間中には何も行わない None during exam period Other information Reference URL Office hours Relations to attainment objectives of learning and education	alphabet mark]							
Objectives of class The class aims to provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. Contents of class The class provides some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Self Preparation and Review Related subjects Notes for textbook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks. troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education	Numbering	ELC_MAS58025						
The class aims to provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis. Contents of class The class provides some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Self Preparation and Review Related subjects Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To a cquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words	Objectives of class							
engineering for the research work of his/her master thesis. Contents of class The class provides some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Self Preparation and Review Related subjects Notes for taxtbook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words	The class aims to provide a ba	sic understanding	of R&D methodolog	y related to the el	lectrical and elect	ronic information		
Contents of class The class provides some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Self Preparation and Review Related subjects Notes for textbook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination 試験期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education	engineering for the research work	of his/her master	thesis.	•				
Contents of class The class provides some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Self Preparation and Review Related subjects Notes for textbook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks. Evaluation of achievement Coursework and presentation are evaluated generally. Examination Stig 期間中には何も行わない None during exam period Details of examination Coffice hours Relations to attainment objectives of learning and education	5							
Solution of values The class provides some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Self Preparation and Review Related subjects Notes for textbook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination 試験期間中には何も行かない None during exam period Details of examination Cother information Reference URL Office hours Relations to attainment objectives of learning and education	Contents of class							
The class provides some fundamental ups to conduct ReD work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors Self Preparation and Review Related subjects Notes for textbook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination Substant of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words	The aloop provides some for '	ontol time to and	at DOD words and a	walk Cantacta - C	ha alaca da:	n the every last		
To be announced by individual supervisors Self Preparation and Review Related subjects Notes for textbook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination StistyBillipticは何行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words	The class provides some fundam	ental tips to condu	Ct R&D work effect	ively. Contents of t	ne class depend o	n the supervisor.		
Self Preparation and Review Related subjects Notes for textbook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks. troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words	to be announced by individual su	pervisors						
Self Preparation and Review Related subjects Notes for textbook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination Solif of examination Obtails of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words								
Related subjects Notes for textbook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination Bitly期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words	Self Preparation and Review							
Related subjects Notes for textbook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination Stisk期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words								
Notes for textbook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination 試験期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education	Related subjects							
Notes for textbook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination Sigs期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words								
Notes for toxubook Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination 試験期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education	Notes for touth oak							
Reference and material will be available from the supervisor. Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination 試験期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words								
Notes for reference Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination Disk期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education	Reference and material will be ave	allable from the sup	ervisor.					
Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination 試験期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words	Notes for reference							
Goals to be achieved To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination 試験期間中には何も行わない None during exam period Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words								
To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination Steps IIII The second	Goals to be achieved							
troubleshooting and communicating outcomes. Evaluation of achievement Coursework and presentation are evaluated generally. Examination 試験期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words	To acquire the ability of identif	ying and formulatir	ng research probler	n, planning and imp	elementing specific	research tasks,		
Evaluation of achievement Coursework and presentation are evaluated generally. Examination 試験期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words	troubleshooting and communication	ng outcomes.						
Coursework and presentation are evaluated generally. Examination 試験期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words	Evaluation of achievement							
Examination 試験期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words	Coursework and presentation are	evaluated generally	/.					
試験期間中には何も行わない None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education	Examination							
None during exam period Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words	試験期間中には何も行わない							
Details of examination Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words	None during exam period							
Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words	Details of examination							
Other information Reference URL Office hours Relations to attainment objectives of learning and education Key words								
Reference URL Office hours Relations to attainment objectives of learning and education Key words	Other information							
Reference URL Office hours Relations to attainment objectives of learning and education Key words								
Reference URL Office hours Relations to attainment objectives of learning and education Key words								
Office hours Relations to attainment objectives of learning and education Key words	Reference URL							
Office hours Relations to attainment objectives of learning and education Key words								
Relations to attainment objectives of learning and education	Office hours							
Relations to attainment objectives of learning and education Key words								
Key words	Relations to attainment objectives of learning and education							
Key words								
Key words								
Key words								
Key words								
Key words								
	Key words							
	Ney Words							

(M42630130)Material Science for Electronics 2[Material Science for Electronics 2]

Subject name[English]	Material Science	for Electronics 2[Naterial Science for	Electronics 2]	
Schedule number	M42630130	Subject area	Advanced	Required or	Elective
			Electrical and	elective	
			Electronic		
			Information		
			Engineering		
Time of starting a course	Fall term	Day of the	Mon.5~5	Credit(s)	2
		week,period			
Faculty	Graduate Program	m for Master's Deg	ree	Subject grade	1~
Department Offered	Electrical and Ele	ectronic Information	n Engineering	Beggining	M1
				grade	
Charge teacher name[Roman	福田 光男,内日	田裕久,中村	雄一, 武藤 浩行	FUKUDA Mitsuo, U	CHIDA Hironaga,
alphabet mark]	NAKAMURA Yuic	chi, MUTO Hiroyuki			
Numbering	ELC_MAS52025				
Objectives of class					
Objective of this subject is to l	earn about the for	refront research a	nd development on	thermoelectronics	and photonics in
electronic materials, and and pow	der processing.				
Objective of this subject is to l	earn about the for	refront research a	nd development on	thermoelectronics	and photonics in
electronic materials, and and pow	der processing.				
Contents of class					
1. Photonics.					
You will learn about photonic mat	erials and devices.				
1) photonic matreials and 2) (nan	o-) photonic device	es.			
2. Spin electronics					
You will learn about materials and	devices in the fiel	d of spin electronic	s.		
1) magnetic materials, 2) magneto	o-optical devices, 3	3) giant magneto-re	sistance devices		
3. Powder processing technologie	S				
You will learn about powder proce	essing techniques f	or electronic devic	es.		
1) sintering, 2) micrstructute of c	eramics and 3) nan	locomposite			
4. Thermoelectronics.					
You will learn about advanced the	ermoelectronic mat	erials and area from	n fundamentals to a	pplications of therm	oelectronics.
1) thermoelectronic materials, 2)	Applications and p	processing of ther	noelectronic materia	als, 3) Thermoelectr	ronic devices and
systems.					
1. Photonics.					
You will learn about photonic mat	erials and devices.				
1) photonic matreials and 2) (nand	o-) photonic device	es.			
· ·					
2 Spin electronics					
You will learn about materials and	l devices in the fiel	d of spin electronic	25		
1) magnetic materials, 2) magnetic	p-optical devices. 3	3) giant magneto-re	sistance devices		
3 Powder processing technologie	S				
You will learn about powder proce	ssing techniques f	or electronic devic	es		
1) sintering 2) micretructure of c	eramics and 3) nan	ocomposite			
1 Thermoelectronics					
You will learn about advanced the	rmaelectronia mot	erials and area from	n fundamentals to o	nnlications of therm	aelectronics
1) thermoelectronic materials 2)	Applications and	ornals and area from	n nunuamentais to a	als 3) Thermoelect	ronic devices and
systems		processing of them	nooloou onio materia	alo, o/ mermoelecu	onio uevices and
cyccomo.					
Solf Drenoration and Devices					
Seir Preparation and Review					
Related subjects					

No	tes for textbook
Le	cture materials will be distributed.
Le	cture materials will be distributed.
No	tes for reference
Go	als to be achieved
It	aims at acquiring the broad knowledge of research and development by learning about the bases of recent research and
de	velopment in various fields.
It a	aims at acquiring the broad knowledge of research and development by learning about the bases of recent research and
de	velopment in various fields.
Εv	aluation of achievement
Th	e reports or tests will be set in each categories.
Th	e result is evaluated from the sum of those marks.
Gr	ades: A:80-100, B:65-79, C:55-64.
Th	e reports or tests will be set in each categories.
Th	e result is evaluated from the sum of those marks.
Gr	ades: A:80-100, B:65-79, C:55-64.
Ex	amination
レア	ポートで実施
Bу	Report
De	tails of examination
Ot	her information
Re	ference URL
Of	fice hours
Ρle	ease make an appointment via e-mail.
Ple	ease make an appointment via e-mail.
Re	lations to attainment objectives of learning and education
Ke	v words

(M42630170)Electrical Energy Systems 2[Electrical Energy Systems 2]

Subject name[English]	Electrical Energy Systems 2[Electrical Energy Systems 2]					
Schedule number	M42630170 Subject area Advanced		Required or	Elective		
			Electrical and	elective		
			Electronic			
			Information			
			Engineering			
Time of starting a course	Fall term	Day of the	Mon.4~4	Credit(s)	2	
		week,period				
Faculty	Graduate Program	Graduate Program for Master's Degree			1~	
Department Offered	Electrical and Elec	Electrical and Electronic Information Engineering			M1	
				grade		
Charge teacher name[Roman	滝川 浩史,櫻井	庸司,穗積 直裕Ⅰ	TAKIKAWA Hirofumi	, SAKURAI Yoji, HO	OZUMI Naohiro	
alphabet mark]						
Numbering	ELC_MAS53025					

Objectives of class

This lecture is implemented as an introduction to electrical energy systems. In order to utilize electric energy in various fields, lectrues on the generation, transmission, distribution and control of electric energy, high voltage engineering, secondary batteries, discharge plasma are given. It is being useful as reference and self-study guide for the professional dealing with this important area. There are three sub courses to choose from.

This lecture is implemented as an introduction to electrical energy systems. In order to utilize electric energy in various fields, lectrues on the generation, transmission, distribution and control of electric energy, high voltage engineering, secondary batteries, discharge plasma are given. It is being useful as reference and self-study guide for the professional dealing with this important area. There are three sub courses to choose from.

Contents of class

Sub Course 1

- 1. Phenomena of ionized gas
- 2. Characteristics of discharge plasma

3. Recent trend in plasma applications

- Sub Course 2
- 1. Lithium-ion Batteries
- 2. Post Lithium-ion Batteries
- 3. Recent Trend in Electrochemical Energy Storage Devices
- Sub Course 3
- 1. Energy propagation thorough distributed medium.
- 2. Diagnosing techniques for industrial and biomedical matters.
- 3. Assessment for high voltage insulation system for power use.

Sub Course 1

- 1. Phenomena of ionized gas
- 2. Characteristics of discharge plasma
- 3. Recent trend in plasma applications

Sub Course 2

- 1. Lithium-ion Batteries
- 2. Post Lithium-ion Batteries
- 3. Recent Trend in Electrochemical Energy Storage Devices Sub Course 3
- 1. Energy propagation thorough distributed medium.
- 2. Diagnosing techniques for industrial and biomedical matters.
- 3. Assessment for high voltage insulation system for power use.
- Self Preparation and Review

Related subjects

Electric Power Systems, Dielectrics and Electrical Insulation, Energy Conversion, Plasma Science Electric Power Systems, Dielectrics and Electrical Insulation, Energy Conversion, Plasma Science

Notes for textbook

Materials will be prepared by the lecturer.

Materials will be prepared by the lecturer.

Notes for reference

Goals to be achieved

To understand the basic knowledge of electric enrgy systems and related fields. To understand the basic knowledge of electric enrgy systems and related fields.

Evaluation of achievement

Marks are based on the final examination or report (100%). Marks are based on the final examination or report (100%).

Examination

定期試験を実施(対面)

Examination(Face to Face)
Details of examination

Other information

Office: C-311, TEL: 0532-44-6727, E-mail: takikawa@ee.tut.jp Office: C-311, TEL: 0532-44-6727, E-mail: takikawa@ee.tut.jp **Reference URL**

Office hours

Before and/or after the lecture and at any time after making the appointment based on e-mail. Before and/or after the lecture and at any time after making the appointment based on e-mail. **Relations to attainment objectives of learning and education**

Key words

Electric Energy, Electric Power, High Voltage, Secondary Battery, Plasma, Electrical Insulation Electric Energy, Electric Power, High Voltage, Secondary Battery, Plasma, Electrical Insulation

(M42630210)Semiconductor Physics 2[Semiconductor Physics 2]

Subject name[English]	Semiconductor P	hvsics 2[Semicondu	ctor Physics 2]		
Schedule number	M42630210	Subject area	Advanced	Required or	Elective
			Electrical and	elective	
			Electronic		
			Information		
			Engineering		
Time of starting a course	Fall term	Day of the	Mon 2~2	Credit(s)	2
		week.period		0.00.000	-
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	1~
Department Offered	Electrical and Ele	ctronic Information	Engineering	Beggining	M1
			0 0	grade	
Charge teacher name[Roman	若原 昭浩,岡田	浩, 河野 剛士 WA	KAHARA Akihiro, C	KADA Hiroshi, KAV	VANO Takeshi
alphabet mark]					
Numbering	ELC_MAS54025				
Objectives of class					
先端的な半導体デバイスのための	D理論 デバイス構	浩 設計や作製プロ	カスを理解すること	を日標とする。	
To understand semiconductor phy	vsics structure de	sign and processing	of advanced semic	conductor devices	
Contents of class					
この科目は前半と後半の2つの割	(分から構成される	前坐でけ nn 接合・	や MOS 構造におけ	る多数および小数	キャリアの振る舞
いについて扱う 注入された小数	ナャリアのダイナミ	。前午 いる 戸 返口 クスについても触わ	ス 後半でけ学生:	゙シシタシシをレ゙シタ がいてから1つのト	ピックスを選択す
る				1.81.1.91.201	
v °					
ィーレッサングディックの化制といって					
1.ナノ構造ナハイスの作製おより	・評価技術(岡田)				
2. ハントエンシニアリングと重十分	の果ナハイス(右原))			
3. 先端 MEMS/NEMS 技術(河野))				
講義に加えて学生が主体的に取	り組むケーススタデ	「ィも実施する。学生	は与えられた課題	こついての調査研究	22や、要求を満足
するデバイスを設計するなどの課	題に取り組み、プレ	/ゼンテーションを行	う。		
This subject consists of two part	s. The first half be	gins by introducing	majority- and mind	ority-carrier behavio	or in fundamental
pn-junction and MOS structures	. Injected minority	carrier dynamics i	n semiconductors	is also included. O	n the latter half,
student choose one from followin	g topics.				
1. Fabrication and characterizatio	n technology for Na	anosturecture devic	es (Prof. Okada)		
2. Band engineering and quantum	effect devices (Pro	of. Wakahara)			
3. Advanced MEMS/NEMS technol	ologies(Prof. Kawan	10)			
Adding to lectures by professor	s in this subject a	a case study is als	o conducted. Name	elv students are re	equired to give a
presentation on researches on th	e given topics, and	on design of device	s that satisfies requ	uired specifications.	squirou co givo u
Solf Proporation and Poviow					
Sell Freparation and Review					
Related subjects					
Notes for textbook	D 1 1 1 1				
S.M.Sze, Physics of Semiconduct	or Devices (Wiley)				
関連する参考文献やデータ、資料	などは講義で配布	する。			
S.M.Sze, Physics of Semiconduct	or Devices (Wiley)				
Related references, data, printed	matters will be give	en in the class.			
Notes for reference					
Goole to be estimat					
Goals to be achieved					

1. 半導体における基本的な物理現象を深く理解し、基本的な半導体デバイスの動作原理を修士課程学生に説明できること

- 2. 与えられた要求仕様を満足する半導体デバイスの基本部分を設計することができること
- 3. 与えられたトピックスを調査し、講義できること

You will be able to:

1. Deeply understand fundamental phenomena in semiconductors, and explain operation principle of basic semiconductor devices to master course students.

2. Design a essential part of semiconductor devcie that satisfies the given specification.

3. Investigate on given topics, and give a lecture on this.

Evaluation of achievement

ケーススタディや研究調査の完成度で評価する。

Achievenemt of lectures of the case study, and writing research reports.

Examination

レポートで実施

By Report Details of examination

Other information

選択に際しては下記の教員にコンタクトすること。

若原昭浩:C-608 wakahara[at]ee.tut.ac.jp 岡田浩:C-303B okada[at]ee.tut.ac.jp 河野剛士:C-603 kawano[at]ee.tut.ac.jp

Before choosing a sub-course, contact to following professors

Akihiro Wakahara:C-608 wakahara[at]ee.tut.ac.jp Hiroshi Okada:C-303B okada[at]ee.tut.ac.jp Takeshi Kawano:C-603 kawano[at]ee.tut.ac.jp

Reference URL

http://www.int.ee.tut.ac.jp http://www.eiiris.tut.ac.jp http://www.int.ee.tut.ac.jp http://www.eiiris.tut.ac.jp

Office hours

Relations to attainment objectives of learning and education

Key words

Solid-state electronics, semiconductor physics, laser diode, low-dimensional quantum devices Solid-state electronics, semiconductor physics, laser diode, low-dimensional quantum devices

(M42630270)Advanced Electronic Information System 2[Advanced Electronic Information System 2]

Subject name[English]	Advanced Electro	Advanced Electronic Information System 2[Advanced Electronic Information System 2]					
Schedule number	M42630270 Subject area Advanced			Required or	Elective		
			Electrical and	elective			
			Electronic				
			Information				
			Engineering				
Time of starting a course	Fall term	Day of the	Mon.1~1	Credit(s)	2		
		week,period					
Faculty	Graduate Program	Graduate Program for Master's Degree			1~		
Department Offered	Electrical and Elec	ctronic Information	Engineering	Beggining	M1		
			grade				
Charge teacher name[Roman	市川 周一, 田村 昌也 ICHIKAWA Shuichi, TAMURA Masaya						
alphabet mark]							
Numbering	ELC_MAS53025						

Objectives of class

The aims of this lecture:

(1) To understand various topics on logic design and computer aided design (CAD),

(2) To understand the role and design of microwave circuits used in wireless communications.

The aims of this lecture:

- (1) To understand various topics on logic design and computer aided design (CAD),
- (2) To understand the role and design of microwave circuits used in wireless communications.

Contents of class

This lecture consists of two themes shown below.

(1) As a result of recent progresses in VLSI technology, the complexity of digital circuit has rapidly increased in these years. Computer-aided design (CAD) is now essential to design logic circuit. This lecture introduces various CAD tools and the algorithms for CAD.

Week 1: LSI design and CAD

Week 2: Logic synthesis

Week 3: Layout

Week 4: Timing analysis

Week 5: Logic simulation

Week 6: Verification

Week 7: Test

Week 8: Examination

(2) The aim of this course is to acquire the knowledge and design techniques of microwave circuits used in wireless communications.

- 1. Transmission line
- 2. Waveguide and modes
- 3. Couplied line and directional coupler
- 4. Application of transmission line 1
- 5. Application of transmission line 2
- 6. Loaded, unloaded and external Q factors of resonator
- 7. Filter design

8. Examination

This lecture consists of two themes shown below.

(1) As a result of recent progresses in VLSI technology, the complexity of digital circuit has rapidly increased in these years. Computer-aided design (CAD) is now essential to design logic circuit. This lecture introduces various CAD tools and the

algorithms for CAD.

Week 1: LSI design and CAD Week 2: Logic synthesis Week 3: Layout Week 4: Timing analysis Week 5: Logic simulation Week 6: Verification

Week 7: Test

Week 8: Examination

(2) The aim of this course is to acquire the knowledge and design techniques of microwave circuits used in wireless communications.

- 1. Transmission line
- 2. Waveguide and modes
- 3. Couplied line and directional coupler
- 4. Application of transmission line 1
- 5. Application of transmission line 2
- 6. Loaded, unloaded and external Q factors of resonator
- 7. Filter design
- 8. Examination

Self Preparation and Review

Related subjects

Prerequisite (1): Fundamental knowledge and skills of logic design, algorithms, and computer structure.

Prerequisite (2): Fundamental Knowledge and skills of high-frequency circuit and electromagnetic engineering

Prerequisite (1): Fundamental knowledge and skills of logic design, algorithms, and computer structure.

Prerequisite (2): Fundamental Knowledge and skills of high-frequency circuit and electromagnetic engineering

Notes for textbook

No textbooks are assigned.

No textbooks are assigned.

Notes for reference

Goals to be achieved

(1) To understand various CAD tools and the algorithms for CAD,

(2) To understand the role and design of microwave circuits used in wireless communications.

(1) To understand various CAD tools and the algorithms for CAD,

(2) To understand the role and design of microwave circuits used in wireless communications.

Evaluation of achievement

Item (1) 50%, Item (2) 50%. Item (1) 50%, Item (2) 50%.

Examination

定期試験を実施(対面)

Examination(Face to Face)

Details of examination

TBD

TBD

Other information

(1) Shuichi Ichikawa, Room C-404, ext. 6897, E-mail: ichikawa@tut.jp

(2) Masaya Tamura, Room C-405, ext. 6754, E-mail: tamura@ee.tut.ac.jp

Shuichi Ichikawa, Room C-404, ext. 6897, E-mail: ichikawa@tut.jp
 Masaya Tamura, Room C-405, ext. 6754, E-mail: tamura@ee.tut.ac.jp

Reference URL

http://www.ccs.ee.tut.ac.jp/`ichikawa/lecture/ http://www.comm.ee.tut.ac.jp/em/index_en.html http://www.ccs.ee.tut.ac.jp/`ichikawa/lecture/ http://www.comm.ee.tut.ac.jp/em/index_en.html

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**

Key words

(1) Logic design, algorithm (2) Microwave circuit, high-frequency circuit design, distributed constant circuit, Electromagnetic Engineering

(1) Logic design, algorithm (2) Microwave circuit, high-frequency circuit design, distributed constant circuit, Electromagnetic Engineering

	Subject name[English] Seminar on Computer Science and Engineering I[Seminar on Computer Science and Engineering I]					
Schedule number	Engineering Ij M43610010 Subject area		Advanced Computer Science and Engineering	Required or elective	Required	
Time of starting a course	Year	Day of week.period	the	Intensive	Credit(s)	4
Faculty	Graduate Program	n for Master's	Degre	e	Subject grade	1~
Department Offered	Computer Scienc	e and Enginee	ring		Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S3系教務委員-	·2, S3系教務	委員	3kei kyomu Iin−S2,	3kei kyomu Iin−S	
Numbering	CMP_MAS71015					
The course is intended for stur- science and engineering. It is also aimed for students to and technical discussion and writ	dents to study bas acquire various skil ing.	sic materials Ils, required ir	in dep gene	th, related to his/ ral research work,	'her research sub <u></u> such as those for	jects in compute oral presentation
Self Preparation and Review 教員が指定する内容に関し、予習 Consult with your advisor. Related subjects 指導教員に問い合わせること。 Consult with your advisor.	∃・復習を行う。 					
Notes for textbook 指導教員に問い合わせること。 Consult with your advisor. Notes for reference						
Goals to be achieved (1)最先端の専門分野の英文が (2)技術的な情報を扱う英文が角 (3)論文の標準的な構成ができる (4)発表というスタイルでの情報 (5)情報の不足を質問という形式 (1) To understand English literatu (2) To interpret technical informa (3) To make a standard construct (4) To provide information by ora (5) To point out the lack of inform	理解でき、わかりや 解釈でき、作文できる 。 是供ができる。 :で指摘できる。 ire on state-of-the tion written in Engl tion of a technical p I presentation. nation by questions	すく説明できな う。 - art areas of ish, and to wr paper.	3₀ expert te suo	ise, and to explain o h information in En	clearly. glish.	

試験期間	中には何	も行わない
------	------	-------

None during exam period

Details of examination 課題レポートやプレゼンテーションに基づいて評価する。 Your supervisor will evaluate your presentation and your reports. **Other information**

Reference URL

Office hours 指導教員に問い合わせること。 Consult with your advisor.

Relations to attainment objectives of learning and education

Key words

Subject name[English]	Seminar on Con	nputer Science an	d Engineering II[Se	minar on Compu	ter Science and
	Engineering II]				
Schedule number	M43610020	Subject area	Advanced Computer Science and Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	2~
Department Offered	Computer Scienc	e and Engineering		Beggining	M1
o	00万批改千号 /	00万批改千号 00		grade	
Charge teacher name_Roman	53杀教務安員,	53糸教務安員-23	kei kyomu lin-S, 3ke	ei kyomu lin-S2	
	CMD MAS71015				
Numbering	CIVIP_IVIAS/1015				
各研究室が指定する情報学に関 技術情報を理解、説明、質疑・応行 The course is intended for stuc science and engineering. It is also aimed for students to a and technical discussion and writi	する最先端の技術 答できる能力を養う lents to study bas acquire various skil ing.	情報(特に英語によ)。 sic materials in dep ls, required in gene	る最先端の技術情報 th, related to his/h ral research work, s	報)を発見する能力 ner research subje uch as those for o	り、ならびに、その ects in computer oral presentation
while specific contents depend of relevant textbooks/research pape Self Preparation and Review 教員が指定する内容に関し、予習 Consult with your advisor. Related subjects 指導教員に問い合わせること。 Consult with your advisor.	on the research ar ers and report on th す。復習を行う。	reas students are in hem, as well as to pi	nvolved in, it is usu resent and discuss o	ally the case for on the research wo	students to reac
Notes for textbook 授業にて指定する。 Consult with your advisor. Notes for reference					
Goals to be achieved (1)最先端の専門分野の英文が弱 (2)技術的な情報を扱う英文が弱 (3)論文の標準的な構成ができる (4)発表というスタイルでの情報表 (5)情報の不足を質問という形式 (1) To understand English literatu (2) To interpret technical informat (3) To make a standard construct (4) To provide information by oral (5) To point out the lack of inform	理解でき、わかりや 釈でき、作文できる。 を と供ができる。 で指摘できる。 re on state-of-the tion written in Engl ion of a technical p presentation. hation by questions	すく説明できる。 る。 -art areas of expert ish, and to write suc paper.	ise, and to explain c ch information in Eng	learly. glish.	
Evaluation of achievement					
技術情報の発見に向けた自主性 導教員が判定する。	、技術情報の理解	度、説明の方法、質	[問への回答、議論	への参加の様子等	^ま から総合的に指
Will be evaluated by taking into a involvements and so on.	accout various fac	tors overall, such a	s technical explanat	ion, question ansv	vering, discussion

Examination 試験期間中には何も行わない None during exam period Details of examination 試験期間中には何も行わない Non during exam period Other information

指導教員に問い合わせること。 Consult with your advisor.

Reference URL

Office hours

指導教員に問い合わせること。 Consult with your advisor.

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						
Sahadula numbar	Science and Engi	neering	Advanced	Doguinad on	Poquirod		
Schedule number	M43010030	Subject area	Advanced	Required or	Required		
			Science and	01000100			
			Engineering				
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6		
Faculty	Graduate Progran	n for Master's Degre	e	Subject grade	1~2		
Department Offered	Computer Science	e and Engineering		Beggining	M2		
	00万势改委员 0	grade					
Charge teacher name_koman alphabet mark]	55米牧務安員,3	53希教務安員一23	kei kyomu lin-S, 3ko	ei kyomu lin-52			
The course is intended for stude	nts to foster their i	nterests in research	problems on comp	uter science and e	ngineering and to		
acquire ability for independent st	udies.						
It is also aimed for students to a	quire, through thes	is research, cooper	ativeness, a sense o	of responsibility, ab	lities for problem		
solving, research planning, decisio	on making, outcome	presentation and s	ubject investigation,	and to enhance th	eir creativity and		
persistency, among others.							
Contents of class							
It is usually the case that thesis	research is carried	out on individual ba	ses with specific co	ntents differing fro	m one student to		
another.	C 11 1 1 1						
Consult with your advisor for any	further details.						
Solf Proparation and Paviaw							
Consult with your advisor for the	m						
Related subjects							
Consult with your advisor for the	m.						
Notes for textbook							
Consult with your advisor for the	m.						
Notes for reference							
Goals to be achieved							
To acquire abilities for doing res	search and develop	ment at technically	high level, sophist	cated decision ma	king, and leading		
large scale research projects.							
Three faculty members will be	assigned to prepar	e the evaluation fo	r vour thesis resea	urch based on pul	plication records		
master thesis, and oral presentat	ion. It will be then	finalized by the facu	Ity meeting.				
Examination							
None during exam period							
Details of examination							
Other information							
Reference URL							
Office hours							
Relations to attainment objective	s of learning and e	ducation					
-	-						

Key words

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

Subject name[English]	Thesis Research	on Computer Sci	ence and Engineer	ing[Thesis Resear	ch on Computer
	Science and Engi	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 Progran	n for Master's Degre	e	Subject grade	1~1
Department Offered	Computer Scienc	e and Engineering		Beggining grade	M1
Charge teacher name[Roman	S3系教務委員,	3系各教員, S3系	教務委員一23kei丨	kyomu Iin-S, 3kei	kakukyouin, 3kei
alphabet mark]	kvomu lin-S2				,
Numbering	CMP MAS61015				
	<u> </u>				
The second is intended for stude					and a second
The course is intended for studer	nts to foster their i	nterests in research	n problems on comp	uter science and e	ngineering and to
acquire ability for independent sti	udies.			6	
It is also aimed for students to ac	cquire, through thes	sis research, cooper	ativeness, a sense o	of responsibility, ab	ilities for problem
solving, research planning, decisio	on making, outcome	presentation and s	ubject investigation,	and to enhance th	eir creativity and
persistency, among others.					
Contents of class					
It is usually the case that thesis I	research is carried	out on individual ba	ses with specific co	ntents differing fro	m one student to
another.				0	
Consult with your advisor for any	further details.				
Solf Propagation and Paviaw					
Consult with your advisor for the	~				
Beleted eubicate					
Consult with your advisor for the	m.				
Notes for textbook					
Consult with your advisor for the	m.				
Notes for reference					
Goola to be achieved					
To convine chilitics for doing rea	and doubles	ment at technically	, high lovel combine	instead desision was	ling and loading
lower acquire abilities for doing res	search and develop	ment at technically	nign level, sophist		iking, anu leauing
Targe scale research projects.					
					н. н. – – – – – – – – – – – – – – – – –
Three faculty members will be a	assigned to prepar	e the evaluation to	r your thesis resea	arch, based on pu	plication records,
master thesis, and oral presentation	ion. It will be then	finalized by the fact	lity meeting.		
試験期間中には何も行わない					
None during exam period					
Details of examination					
Other information					
Deferment LIDI					
Reference URL					
Office hours					

Relations to attainment objectives of learning and education

Key words

(M4361003T)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 Engi	neering]	r	T			
Schedule number	M4361003T	Subject area	Advanced	Required or	Required		
			Computer	elective			
			Science and				
Time of starting a course	Year	Day of the	Intensive	Credit(s)	6		
		week,period			-		
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	2~		
Department Offered	Computer Scienc	e and Engineering		Beggining	M2		
	00万井改千日	0.5.2 4 - 0.5 5	势 改委员 000 1	grade			
Charge teacher name_Roman	S3杀教務安員,	3糸谷教員, 53糸	敎務安員─23kei	kyomu lin-S, 3kei	kakukyouin, 3kei		
Numbering	CMP MAS61015						
Objectives of class							
The course is intended for stud	dents to study bas	sic materials in dep	th, related to his/	her research subje	ects in computer		
science and engineering.	-			5			
It is also aimed for students to a	acquire various skil	ls, required in gene	ral research work, s	such as those for	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 usu	ually the case for	students to read		
self Preparation and Paviow	ers and report on th	nem, as well as to p	resent and discuss	on the research wo	ork of their own.		
Belated subjects							
Consult with your advisor							
Sonsaie with your advisor.							
Notes for textbook							
Consult with your advisor.							
Notes for reference							
Goals to be achieved							
To acquire abilities for technical	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.							
試験期間中には何も行わない							
None during exam period							
Details of examination							
Other information							
Reference URL							
Office hours							
Relations to attainment objective	s of learning and e	ducation					
Kev words							
	Seminar on Co	mputer Science a	nd Engineering[Ser	minar on Comput	er Scier		
--	--	--	--	---	------------------------	--	--
Engineering]							
Schedule number	M43610040	Subject area	Advanced Computer Science and Engineering	Required or elective	Required		
Time of starting a course	Year	Day of the week.period	Intensive	Credit(s)	6		
Faculty	Graduate Program	m for Master's Degre	e	Subject grade	2~		
Department Offered	Computer Science and Engineering Beggining M1 grade						
Charge teacher name[Roman alphabet mark]	S3系教務委員, \$	S3系教務委員一23	kei kyomu Iin−S, 3k	ei kyomu Iin-S2			
Numbering	CMP_MAS61015						
12月11日和ビビ生件、武功、良気・か The course is intended for stud science and engineering. It is also aimed for students to and technical discussion and writ	自てきる能力を強う Jents to study bas acquire various skii ing.	sic materials in dep lls, required in gene	th, related to his/ ral research work, s	her research subje such as those for	ects in c oral pres		
Consult with your advisor. Related subjects							
指導教員に問い合わせること。 Consult with your advisor.							
指導教員に問い合わせること。 Consult with your advisor. Notes for textbook 指導教員に問い合わせること。 Consult with your advisor.							
指導教員に問い合わせること。 Consult with your advisor. Notes for textbook 指導教員に問い合わせること。 Consult with your advisor. Notes for reference							
指導教員に問い合わせること。 Consult with your advisor. Notes for textbook 指導教員に問い合わせること。 Consult with your advisor. Notes for reference Goals to be achieved (1)最先端の専門分野の英文が (2)技術的な情報を扱う英文が例 (3)論文の標準的な構成ができる (4)発表というスタイルでの情報 (5)情報の不足を質問という形式	理解でき、わかりや ¥釈でき、作文できる ら。 提供ができる。 ∵で指摘できる。	っすく説明できる。 る。					
指導教員に問い合わせること。 Consult with your advisor. Notes for textbook 指導教員に問い合わせること。 Consult with your advisor. Notes for reference Goals to be achieved (1)最先端の専門分野の英文が (2)技術的な情報を扱う英文が解 (3)論文の標準的な構成ができる (4)発表というスタイルでの情報 (5)情報の不足を質問という形式 (1) To understand English literatu (2) To interpret technical information (3) To make a standard construct (4) To provide information by ora	理解でき、わかりや 罪釈でき、作文できる な。 提供ができる。 ;で指摘できる。 ire on state-of-the tion written in Engl tion of a technical p l presentation.	⊃すく説明できる。 る。 ──art areas of expert lish, and to write suc paper.	ise, and to explain o	clearly. glish.			
指導教員に問い合わせること。 Consult with your advisor. Notes for textbook 指導教員に問い合わせること。 Consult with your advisor. Notes for reference Goals to be achieved (1)最先端の専門分野の英文が (2)技術的な情報を扱う英文が解 (3)論文の標準的な構成ができる (4)発表というスタイルでの情報 (5)情報の不足を質問という形式 (1) To understand English literatu (2) To interpret technical information (3) To make a standard construct (4) To provide information by ora (5) To point out the lack of inform Evaluation of achievement	理解でき、わかりや 録釈でき、作文できる る。 そけができる。 で指摘できる。 ire on state-of-the tion written in Engl tion of a technical p l presentation. nation by questions	♀すく説明できる。 る。 ーart areas of expert lish, and to write suc paper. 5.	ise, and to explain c sh information in En	slearly. glish.			
指導教員に問い合わせること。 Consult with your advisor. Notes for textbook 指導教員に問い合わせること。 Consult with your advisor. Notes for reference Goals to be achieved (1)最先端の専門分野の英文が (2)技術的な情報を扱う英文が例 (3)論文の標準的な構成ができる (4)発表というスタイルでの情報 (5)情報の不足を質問という形式 (1) To understand English literatu (2) To interpret technical informa (3) To make a standard construct (4) To provide information by ora (5) To point out the lack of inform Evaluation of achievement 技術情報の発見に向けた自主性 導教員が判定する。	理解でき、わかりや ² 釈でき、作文できる。 こで指摘できる。 :で指摘できる。 ire on state-of-the ition written in Engl tion of a technical p l presentation. nation by questions :、技術情報の理解	oすく説明できる。 る。 art areas of expert lish, and to write suc paper. 3. 程度、説明の方法、質	ise, and to explain c ch information in En 可問への回答、議論	slearly. glish. への参加の様子等	5から総合		

試験期間中には何も行わない
None during exam period
Details of examination
課題レポートやプレゼンテーションに基づいて評価する。
Your supervisor will evaluate your presentation and your reports.
Other information
Reference URL
Office hours
Relations to attainment objectives of learning and education
Key words

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

Subject name[English]	Image Processing, Advanced[Image Processing, Advanced]							
Schedule number	M43630100	Subject area	Advanced	Required or	Elective			
			Computer	elective				
			Science and					
			Engineering					
Time of starting a	Fall term	Day of the	Tue.2~2	Credit(s)	2			
course		week,period						
Faculty	Graduate Program for Master's Deg	gree		Subject	1~			
				grade				
Department Offered	Computer Science and Engineering			Beggining	M1			
				grade				
Charge teacher	金澤 靖, 菅谷 保之 KANAZAWA	Yasushi, SUGAYA	. Yasuyuki					
name[Roman alphabet								
mark]								
Numbering	CMP_MAS53225							

Objectives of class

This course involves fundamentals and advanced issues on image processing and computer vision.

This course involves fundamentals and advanced issues on image processing and computer vision.

Contents of class

[Kanazawa]

- 1: Introduction
- 2: Projective Geometry
- 3: Epipolar Geometry
- 4: 3-D Reconstruction from Two Views
- 5: Affine Projection
- 6: Uncalibrated Stereo
- 7: Structure from Motion
- 8: Experiments

[Sugaya]

- 9: Mathematical Introduction
- 10: Limits of Functions
- 11: Optimization of Functions
- 12: Least Squares

13: Advance of Least Squares

- 14: Non-linear Optimization
- 15: Maximum Likelihood

[Kanazawa]

- 1: Introduction
- 2: Projective Geometry
- 3: Epipolar Geometry
- 4: 3-D Reconstruction from Two Views
- 5: Affine Projection
- 6: Uncalibrated Stereo
- 7: Structure from Motion
- 8: Experiments

[Sugaya]

- 9: Mathematical Introduction
- 10: Limits of Functions
- 11: Optimization of Functions
- 12: Least Squares
- 13: Advance of Least Squares
- 14: Non-linear Optimization
- 15: Maximum Likelihood

Self Preparation and R	eview					
The handouts are avail	able via web pa	ge beforehand.				
The handouts are avail	able via web pa	ge beforehand.				
Related subjects						
Geometry, Linear Algeb	ora, Statistics.					
Geometry, Linear Algel	ora, Statistics.					
Notes for textbook						
Handouts will be prepa	red.					
Handouts will be prepa	red.					
Keterence I	BOOK TITIE	Multiple View Geom	etry		ISBN	
	Author	R.I. Hartley and A. Zisserman	Publisher	Cambridge University Press	Publish year	2000
Reference2	Book title	Computer Vision	A Modern App	roach	ISBN	
	Author	D.A. Forsyth and	Publisher	Prentice Hall	Publish year	2003
Reference3	Book title	Guide to 3D Vision	Computation		ISBN	
	A. the second		Dublich	Service are in		2016
	Author	r. Kanatanı, Y. Sugaya, and Y. Kanazawa	Publisher	Springer	Pudlish year	2010
Notes for reference		NdHazawa				
Ocole to be achieved						
Goals to be achieved	undomontale on	d advanced issues on i	imaga pragagir	and computer vision	n including:	
- camera model		u auvanceu issues on	image processir	ig and computer visio	n including.	
 epipolar geometry. 						
- 3-D reconstruction f	rom images,					
- optimization	-					
Understanding of the f	undamentals and	d advanced issues on i	image processir	ng and computer vision	n including:	
– camera model,						
– epipolar geometry,						
- 3-D reconstruction f	rom images,					
- optimization	t					
Evaluation of achieven	ient d by all aubmitt	tad raparta:				
	eu by an Submit	teu reports.				
B: score ≥ 65						
C: score >= 55						
Grade will be determine	ed by all submit	ted reports:				
A: score >= 80						
B: score >= 65						
C: score >= 55						
Examination						
レホートで実施						
By Report						
Details of examination						
Other information						
Room F-404, Ext. 6888	8, Email: kanazav	wa@cs.tut.ac.jp (Yasus	hi Kanazawa)			
Room C-507, Ext. 6760), Email: sugaya	@iim.cs.tut.ac.jp (Yasuy	/uki Sugaya)			
Room F-404, Ext. 6888 Room C-507, Ext. 6760	8, Email: kanazav), Email: sugaya	wa@cs.tut.ac.jp (Yasus @iim.cs.tut.ac.jp (Yasuy	hi Kanazawa) /uki Sugaya)			
Reference URL						
http://www.img.cs.tut.a	ac.jp/					
http://www.img.cs.tut.a http://www.iim.cs.tut.a	ac.jp/ c.jp/					
http://www.img.cs.tut.a http://www.iim.cs.tut.a http://www.img.cs.tut.a	acjp/ cjp/ acjp/					
http://www.img.cs.tut.a http://www.iim.cs.tut.a http://www.iim.cs.tut.a	acjp/ cjp/ acjp/ cjp/					

Relations to attainment objectives of learning and education

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

(M43630240)Networking, Advanced 1[Networking, Advanced 1]

Subject name[English]	Networking, Advanced 1[Networking, Advanced 1]							
Schedule number	M43630240	Subject area	Advanced	Required or	Elective			
			Computer	elective				
			Science and					
			Engineering					
Time of starting a	Fall1 term	Day of the	Wed.2~2	Credit(s)	1			
course		week,period						
Faculty	Graduate Program for Master's De	egree		Subject	1~			
				grade				
Department Offered	Computer Science and Engineering	g		Beggining	M1			
				grade				
Charge teacher	梅村 恭司 UMEMURA Kyoji							
name[Roman alphabet								
mark]								
Numbering	CMP_MAS52325							

Objectives of class

The objective of this class is mastering both profound and advanced networking technologies behind computer network programs. Precise protocols are lectured to enhance the knowledge of Internet.

The objective of this class is mastering both profound and advanced networking technologies behind computer network programs.. Precise protocols are lectured to enhance the knowledge of Internet.

Contents of class

1. Link Layer

- 2. Internet Protocol
- 3. Address Resolution Protocol
- 4. Internet Control Message Protocol
- 5. IP routing and Dynamic Routing Protocol
- 6. Transmission Control Protocol
- 7. User Datagram Protocol and Multicasting
- 1. Link Layer
- 2. Internet Protocol
- 3. Address Resolution Protocol
- 4. Internet Control Message Protocol
- 5. IP routing and Dynamic Routing Protocol

6. Transmission Control Protocol

7. User Datagram Protocol and Multicasting

Self Preparation and Review

Related subjects

The basic knowledge about the structure of client/server programs is required.

The basic knowledge about the structure of client/server programs is required.

Textbook1	Book title	TCP/IP	Illustrated	Volume. 1, The P	rotocols,	ISBN	
	Author	W. Stoveno	Richard	Publisher	Addison-wesley	Publish year	
		Stevens					

Notes for textbook

TCP/IP Illustrated Volume. 1, The Protocols,

W. Richard Stevens, Addison-wesley

TCP/IP Illustrated Volume. 1, The Protocols, W. Richard Stevens, Addison-wesley

Notes for reference

Goals to be achieved The goal is to understand precisely the structure of internet protocol with which computer network works. The goal is to understand precisely the structure of internet protocol with which computer network works. Evaluation of achievement Examination will be held in the last class. Examination will be held in the last class. Examination 定期試験を実施(対面) Examination(Face to Face) Details of examination Other information C-304 umemura@tut.jp C-304 umemura@tut.jp Reference URL http://www.ss.cs.tut.ac.jp/ http://www.ss.cs.tut.ac.jp/ **Office hours** From 10:00AM to 13:00, Tue to Fri (Appointment are strongly recommended) From 10:00AM to 13:00, Tue to Fri (Appointment are strongly recommended) Relations to attainment objectives of learning and education Key words Computer Network, Distributed Systems Computer Network, Distributed Systems

(M43630250)Networking, Advanced 2[Networking, Advanced 2]

Subject	Networking, Advanced 2[Networking, Advanced 2]							
name[English]					1			
Schedule number	M43630250		Subject area	Advanced	Required or	Elective		
				Computer	elective			
				Science and				
				Engineering				
Time of starting a	Fall2 term		Day of the	Wed.2~2	Credit(s)	1		
course			week,period					
Faculty	Graduate Pro	ogram for Master's De	egree		Subject	1~		
	<u> </u>				grade			
Department Offered	Computer So	cience and Engineerin	g		Beggining	MI		
					grade			
Charge teacher	入竹康田	IURA Ren						
name[Roman								
alphabet markj		005						
Numbering	CMP_MAS52	325						
Objectives of class								
The aim of this class is	to understand	the concepts, system	m architecture, ai	nd algorithm in distr	ributed computi	ng. The class will		
cover both of theoretic	al discussion a	and practical application	ons.					
The contents will focus	s on advanced	topics in distributed	systems, namely	the knowledge of a	computer netwo	ork and basics of		
distributed systems are	e required befo	rehand.						
The aim of this class is	to understand	d the concepts, system	m architecture, ai	nd algorithm in distr	ributed computi	ng. The class will		
cover both of theoretic	al discussion a	and practical application	ons.	0		•		
The contents will focus	s on advanced	topics in distributed	systems, namely	the knowledge of a	computer netwo	ork and basics of		
distributed systems are	e required befo	rehand.		0				
Contento of class								
From the 1st to 2rd we	ek; Synchroniz	ation						
From the 2nd to 3rd we	ek; Consisten	су						
From the 4nd to 5rd we	eek; Fault toler	ance						
From the 6th to 7th we	ek; Security							
The 8th week; Examina	tion or addition	nal topics						
From the 1st to 2rd we	ek; Synchroniz	ation						
From the 2nd to 3rd we	eek; Consisten	су						
From the 4nd to 5rd we	ek; Fault toler	ance						
From the 6th to 7th we	ek; Security							
The 8th week; Examina	tion or additior	nal topics						
Self Preparation and R	eview							
It is strongly recomme	nded to read	over the reference b	ook, "Distributed	Systems: Principle	s and Paradigm	ns (2nd Edition)"		
and to search keyword	s in the book o	on Internet to find prac	ctical examples.					
It is strongly recomme	nded to read	over the reference b	ook, "Distributed	Systems: Principle	s and Paradigm	ns (2nd Edition)"		
and to search keyword	s in the book o	on Internet to find prac	ctical examples.					
Related subjects								
Computer Network, Op	erating System	ns, System Programm	ing, (Basics of Dis	stributed Systems)				
Computer Network, Op	erating System	ns, System Programm	ing, (Bas <mark>ics of Dis</mark>	stributed Systems)				
Notes for textbook								
Basically, materials refe	erenced in the	class are passed out	in the class.					
Basically, materials refe	erenced in the	class are passed out	in the class.					
Reference1	Book title	Distributed systems	: principles and p	paradigms	ISBN	978-		
						0132392273		
	Author	Andrew S.	Publisher	Pearson	Publish	2007		
		Tanenbaum.		Prentice Hall	year			
		Maarten van						
		Steen						
Notes for reference		1	1	1	1			
Related materials such	as books vide	eos. and web nages a	re introduced in t	he class				
Related materials, such	as books vide	eos, and web nages a	re introduced in t	he class.				
Goals to be achieved		.,						

The aim of this class is to understand;

(1) the basic methods and concepts of synchronization in distributed systems;

(2) the concepts and variations of consistency in distributed systems;

(3) the basic concepts and methods of fault tolerance in distributed systems;

 $\ensuremath{\left(4\right)}$ the basic concepts of security in distributed systems;

 $(\mathbf{5})$ and some practical examples of distributed systems.

The aim of this class is to understand;

(1) the basic methods and concepts of synchronization in distributed systems;

(2) the concepts and variations of consistency in distributed systems;

(3) the basic concepts and methods of fault tolerance in distributed systems;

(4) the basic concepts of security in distributed systems;

(5) and some practical examples of distributed systems.

Evaluation of achievement

The achievement of students are evaluated mainly with a paper test or a report, while the score of quizzes held in the class and attendance ratio are taken into account.

A: 80 and over

B: 65 and over

C: 55 and over

The achievement of students are evaluated mainly with a paper test or a report, while the score of quizzes held in the class and attendance ratio are taken into account.

A: 80 and over

B: 65 and over

C: 55 and over

Examination その他

Other

Details of examination

A paper examination is carried out in the last class OR a report related to distributed systems is assigned. These are selected according to the number of students.

A paper examination is carried out in the last class OR a report related to distributed systems is assigned. These are selected according to the number of students.

Other information

Teacher's Room: C-509 Internal Phone Number: 6750 E-mail: ren@tut.jp Teacher's Room: C-509 Internal Phone Number: 6750

E-mail: ren@tut.jp

http://www.usl.cs.tut.ac.jp http://www.usl.cs.tut.ac.jp

Office hours

You can ask any questions anytime by e-mail. If you come to the teacher's office, you need to have an appointment. You can ask any questions anytime by e-mail. If you come to the teacher's office, you need to have an appointment. **Relations to attainment objectives of learning and education**

Key words

Distributed System, Computer Network, Operating System Distributed System, Computer Network, Operating System

(M43630260)Advanced	Robotics and l	informatics 1[Advand	ced Robotics and	Informatics 1]		
Subject	Advanced Ro	obotics and Informat	ics 1[Advanced R	obotics and Informa	itics 1]	
name[English]			1		I	I
Schedule number	M43630260		Subject area	Advanced	Required or	Elective
				Computer Science	elective	
				Engineering		
Time of starting a	Fall1 term		Dav of the	Tue.3~3	Credit(s)	1
course			week,period			
Faculty	Graduate Pro	ogram for Master's D	Degree		Subject	1~
					grade	
Department Offered	Computer So	cience and Engineeri	ng		Beggining grade	M1
Charge teacher	三浦 純 MIL	JRA Jun				I
name[Roman						
alphabet mark]						
Numbering	CMP_MAS53	225				
Objectives of class						
Fundamental and adva	nced issues ir	n intelligent robotics	s will be discusse	ed. Topics included	are probabilist	ic sensor fusion
techniques (e.g., Kalmar	n filter and part	ticle filter) and its ap	plication to mobil	e robot localization	and mapping.	
Contents of class						
Week 1: Introduction to	scene recogni	tion and sensor fusio	on.			
Week 2: Probability basi	ic and Bayes fi	lter.				
Week 3: Kalman filter an	id its extension	ns.				
Week 5: Mobile robot lo	calization					
Week 6: Mobile robot m	apping					
Week 7: SLAM (Simulta	neous Localiza	tion and Mapping).				
Week 8: Presentations	of students' re	ports and conclusion	IS.			
Self Preparation and Re	eview					
Related subjects						
Fundamental knowledge	of linear algeb	ora and probability th	eory is useful.			
Notes for textbook						
Handouts will be prepar	ed. The main r	eference is shown be	elow.			
		<u> </u>				
Reference 1	Book title	Probabilistic Robo	tics		ISBN	978-
	Author	S Thrup W	Publicher	The MIT Press	Dublich veer	2005
	Audioi	Burgard D. Fox	Fublisher	The With Fress	r ublish year	2005
Notes for reference	1	Dangara, Dri ex				
Goals to be achieved						
Understanding of the fu	ndamentals of	sensor fusion strate	gies and algorithn	ns.		
Evaluation of achievem	ent		0 0			
Grade will be determine	d by final pres	entation and report.				
Examination						
レポートで実施						
By Report						
Details of examination						
Other information						
Room C-604, Ext. 6773	, Email: jun.miu	ra@tut.jp (Jun Miura))			
Reference URL						
http://www.aisl.cs.tut.a	c.jp/classes/ro	botics-and-informat	tics/			

ID and password will be given at the class. **Office hours**

Make an appointment beforehand by email.

Relations to attainment objectives of learning and education

Key words Robotics

(M43630270)Advanced Robotics and Informatics 2[Advanced Robotics and Informatics 2]

Subject name[English]	Advanced Ro	botics and Informati	cs 2[Advar	nced Ro	obotics and Informat	ics 2]	
Schedule number	M43630270		Subject	area	Advanced	Required or	Elective
			•		Computer	elective	
					Science and		
					Engineering		
Time of starting a	Fall2 term		Day of	the	Tue.3~3	Credit(s)	1
Course Ecoulty	Graduata Bra	arrom for Mostor's D	week,pe	lou		Subject	1~
Faculty	Graduate Pro	ogram for Master's D	egree			Subject grade	1~
Department Offered	Computer So	cience and Engineerir	ng			Beggining	M1
Charge teacher	岡田 羊知甲	OKADA Michia				grade	
onarge teacher		ONADA MICHIO					
nametroman alphabet							
markj Numberine		005					
Numbering	CMP_MAS53	225					
Objectives of class							
認知的なロボティクスの	歴史的背景, 粘	犬況的な認知とロボッ	小の身体に	生,社会	会的相互行為, 社会(的なロボットの社	L会実装などに
ついて学ぶ.							
Fundamental and advan	and include on	annial robotion will	ha diaqua	and au	ah an historiaal haa	karaund of oom	aitiva rabatica
		social robotics will	be discuss	sea su	ch as historical bac	kground of cogi	illive robolics,
embodied cognition, orga	nizing social in	iteraction and applica	ations of so	ociai ro	DOTS.		
Contents of class							
講義内容は次の通りとす	る.						
- Historical background	of cognitive rol	botics					
 Situated cognition and 	biological-insp	pired robots					
 Embodiment and social 	embeddednes	s					
- Organizing social inter	action in social	robots					
- Socially assistive robot		100000					
- Presentation and discu	iccion						
	1551011						
 Historical background 	of cognitive rol	botics					
 Situated cognition and 	biological-insp	pired robots					
 Embodiment and social 	embeddednes	S					
- Organizing social intera	action in social	robots					
- Socially assistive robot	tics						
- Presentation and discu	ission						
Self Preparation and Rev	view						
あらかじめ予習のための	 参考文献を提	示します					
References on the class	will be prepare	-d					
Related subjects	will be propule	5 u .					
Fundamentale of compiti	va agianga						
Fundamentals of cogniti	ve science.						
Netes for textback	ve science.						
	-						
ハントゲリトを用意しま9							
Handouts will be prepare	d.						
Reference 1	Book +itle	Understanding Inte	alligence			ISBN	
	Author		Dubliche	r	MIT Press	Publish year	2001
	Audior	Scheier	Fublishe	•	MITI LI222	-upiish year	2001
Notes for reference	. <u> </u>	30100	1		I	I	1
Goals to be achieved							

社会的なロボットに関する基本的事項を理解することを達成目標とする.

- Historical background of cognitive robotics
- Situated cognition and biological-inspired robots
- Embodiment and social embeddedness
- Organizing social interaction in social robots
- Socially assistive robotics

Understanding of the fundamentals of social robotics including:

- Historical background of cognitive robotics
- Situated cognition and biological-inspired robots
- Embodiment and social embeddedness
- Organizing social interaction in social robots
- Socially assistive robotics

Evaluation of achievement

プレゼンテーションと最終レポートの内容で評価する.

Grade will be determined by the presentations in the class and final report.

Examination

レポートで実施

By Report

Details of examination

Other information

Room F-402, Ext, 6886, Email: okada[at]tut.jp (Michio Okada)

Room F-402, Ext, 6886, Email: okada[at]tut.jp (Michio Okada)

Reference URL

http://www.icd.cs.tut.ac.jp/ http://www.icd.cs.tut.ac.jp/en/profile.html

Office hours 火曜日, 14:30-16:00 Tuesday, 14:30-16:00

Relations to attainment objectives of learning and education

情報・知能工学専攻 (D)広範囲の知識を有機的に連携させた研究開発方法論の体得 広範囲の知識の連携による研究開発に対する方法論を体得し、研究開発の計画立案と、それを実践できる能力 (E)国内外において活躍できる表現力・コミュニケーションカ 論文、ロ頭及び情報メディアを通じて、自分の論点や考えなどを国の内外において効果的に表現し、コミュニケーションする能力 とプレゼンテーションする能力

Key words

社会的ロボティクス, 認知ロボティクス, 社会的相互行為 Social Robotics, Cognitive Robotics, Social Interaction

(M43630300)Complex Systems and Intelligent Informatics 1[Complex Systems and Intelligent Informatics 1]

Subject name[English]	Complex Systems and Intelligent Informatics 1[Complex Systems and Intelligent Informatics						
	1]						
Schedule number	M43630300	Subject area		Advanced	Required or	Elective	
				Computer	elective		
				Science and			
Time of starting a summer	E-III +	Davis of A	h h a	Engineering	0	1	
Time of starting a course	Failt term	Day of t	ule	wed.3~3	Great(s)	1	
Faculty	Graduate Program	n for Master's D	Degre	e	Subject grade	1~	
Department Offered	Computer Scienc	e and Engineerir	ng		Beggining	M1	
-					grade		
Charge teacher name[Roman	村越 一支 MURA	KOSHI Kazushi	i				
alphabet mark]							
Numbering	CMP_MAS53125						
Objectives of class							
The aim of this class is to unders	tand complex and i	ntelligent syster	ms.				
To achieve the aim, this class off	ers knowledge and	skills for mather	matic	al modeling and sin	nulation methods.		
A Introduction							
A. Introduction What is complex and intelligent sy	stems? Outline of	the brain system	n				
B. Computational Neuroscience a	and Application-orie	ented Mathemati	ical N	Iodels			
What is computational Neuroscier	nce and artificial ne	ural networks?					
C. Model Neurons							
Structure of neurons, synapse, m	odel neurons.						
D. Learning at connected part of	neurons (synapse)						
Synaptic plasticity, spike-timing-	dependent plasticity	y (STDP).					
E. Simulation Methods							
Numerical calculation methods fo	r single neuron, neu	ıral network fror	m sin	gle neuron.			
F. Simulation Environments							
Explanation and demonstration of	simulation environ	ments such as l	NEUF	ON and GENESIS.			
What is self-organizing? Winner T	akes All Self-organ	nizing man (SON	/)				
H. Reinforcement Learning	ares All, Gell Olgal						
What is reinforcement learning,	reinforcement lean	ning in the brai	in, de	monstration of rei	inforcement learni	ng for controlling	
robot							
I. Summary							
1st week: A							
2nd week: B							
3rd week: C							
4th week: D							
6th week: C							
7th week: H I							
Self Preparation and Review							
-							
Related subjects							
Notes for textbook							
Handouts are distributed.							
Notes for reference							
Goals to be achieved							
- Know complex and intelligent m	nathematical models	s, and understar	nd th	em at the degree v	vhich you can sim	ulte them by your	
programming or by using simulation	on environment.						

- Can explain technical terms of complex and intelligent mathematical models.
- Master numerical calculation methods that are used in complex and intelligent mathematical models.

Evaluation of achievement

Examination 100% + alpha (Consideration, comment, and opinion in each content (A-H))

Examination その他

Other

Details of examination

Other information

Even school year: Murakoshi, F-507, ext. 6899, mura [at] tut.jp

Reference URL

http://www.ci.cs.tut.ac.jp/~mura/

Office hours

After this class

Relations to attainment objectives of learning and education

(D)広範囲の知識を有機的に連携させた研究開発方法論の体得 広範囲の知識の連携による研究開発に対する方法論を体得し,研究開発の計画立案と,それを実践できる能力

Key words

(M43630310)Complex Systems and Intelligent Informatics 2[Complex Systems and Intelligent Informatics 2]

Subject name[English]	Complex Systems and Intelligent Informatics 2[Complex Systems and Intelligent Informatics 2]						
Schedule number	M43630310	Subject are	a	Advanced Computer Science and Engineering	Required or elective	Elective	
Time of starting a course	Fall2 term	Day of week,period	the	Tue.4~4	Credit(s)	1	
Faculty	Graduate Program	n for Master's	Degre	e	Subject grade	1~	
Department Offered	Computer Scienc	e and Enginee	ring		Beggining grade	M1	
Charge teacher name[Roman alphabet mark]	石田 好輝 ISHID	A Yoshiteru					
Numbering	CMP_MAS53125						
Objectives of class	_						
This course provides opportunitie	s to learn the follo	wings:					
* Modeling and analysis on compl	ex systems and lea	rning systems					
* System theoretic analysis on co	omplex systems and	d learning syst	tems ,				
* Computer simulations and implie	cations, and	2,					
* Implementation of complex syst	ems and learning s	ystems.					
Recent topics on complex system	is and learning syst	ems will be al	so dis	cussed in the cours	e.		
Contents of class							
1 Introduction on complex dynam	ical systems						
2 Dynamical systems							
3. Complex networks and interact	ions						
4. Cellular automata and neural ne	etworks						
5. Information Processing by com	plex systems						
6. Emergence of cooperation in a	utonomous agents						
7. Learning algorithms for agents							
8. Evolutionary algorithms for age	nts						
9. Biological systems and informa	tion processing						
Self Preparation and Review							
Related subjects							
Notes for textbook							
No textbook References other th	an below will be su	ggested at the	e first	class			
Ishida, Y.: Self-Repair Networks. S	Springer (2015):	8800000 00 000					
Ishida, Y.: Immunity-Based Syster	ns. Springer (2004)	:					
Barabasi, A.L.: Linked, Perseus, (2	2002)						
Strogatz, S. H. Sync, Hyperion (2	003)						
Notes for reference							
Goals to be achieved							
Evaluation of achievement							
Class performance (50%) and term	n-end report (50%)						
Examination							
その他							
Other							
Details of examination							
Other information							
Room F-504, Ext. 6895							
Reference URL							

Office hours Wednesday 16:30-17:00

Relations to attainment objectives of learning and education

情報・知能工学専攻 (A)幅広い人間性と考え方 人間社会を地球的な視点から多面的にとらえ、自然と人間との共生、人類の幸福・健康・福祉について考える能力 (C)理論的・応用的知識の獲得と発展的活用能力 重要な学術・技術分野の理論・応用知識を自発的に獲得し、発展的に活用できる能力 (D)広範囲の知識を有機的に連携させた研究開発方法論の体得 広範囲の知識の連携による研究開発に対する方法論を体得し、研究開発の計画立案と、それを実践できる能力 (E)国内外において活躍できる表現力・コミュニケーションカ 論文、口頭及び情報メディアを通じて、自分の論点や考えなどを国の内外において効果的に表現し、コミュニケーションする能力 とプレゼンテーションする能力

Key words

complex systems, cellular automaton, artificial life, immuno intelligence, neural networks, evolutionary game theory

(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						Life Science I]
Schedule number	M44610010	Subje	ct are	a	Advanced	Required or	Required
					Environmental	elective	
					and Life		
					Sciences		
Time of starting a course	Year	Day	of	the	Intensive	Credit(s)	3
		week,	period				
Faculty	Graduate Program	n for Ma	aster's	Degr	ee	Subject grade	1~
Department Offered	Environmental an	d Life S	cience	es		Beggining	M1
	<u>。</u>					grade	
Charge teacher name[Roman	S4糸教務安員 4	kei kyon	nu lın-	-S			
alphabet mark							
	EINV_IVIAS55015						
This course will provide the stu	idents with opport	unities	to stu	udy or	his/her research	subjects on enviro	onmental and life
sciences by reading textbooks a	nd scientific paper	s under	the g	guidano	ce of his/her superv	visor. The aim of t	he lessen for the
students is to learn knowledge ar	nd presentation skil	ls requi	red foi	r his/r	ier research in the s	eminar as well as t	o deepen his/her
understanding of environmental a	ind life sciences.						
The students will be required to	read textbooks and	papers	s writt	en by	other language than	Japanese, especia	ally English, which
are suggested by his/her supervi	sor, and to report a	and disc	uss de	eeply o	on his/her research	subject in the semi	nar.
Sen Preparation and Review							
Related subjects							
Seminar on Environmental and Li	fe Science II						
Thesis Research on Environment	al and Life Science						
All other relevant subjects in Adv	anced Environmen	tal and I	Life So	cience	s		
Notes for textbook							
Supervisor will recommend textb	ooks, papers, and re	esearch	mater	rials to	o students.		
Notes for reference							
Goals to be achieved							
I o acquire basic knowledge on ei	nvironmental and lif	e sciene	ces				
To understand the contents of so	cientific papers in a	given t	ield of	envir	onmental and life sci	ences	
To be able to make oral and post	er presentations re	elevant t	o pap	ers he	/she has read.		
Evaluation of achievement	c						
The evaluation is based on the	scores of reading	textboo	ks and	d scie	ntific papers, discus	sions, reports and	presentations of
his/her research in the seminar.	His/ner supervisor	evaluat	es the	score	S.		
EXamination 計除期間内には何もなない							
試験期间中には明も1770ない							
None during examperiod							
Other information							
http://apa.tut.ag.ip/ap/							
Students are encouraged visiting	by appointment						
Relations to attainment objective	appointment.	ducatio	n				
1							
1							
Key words							
Environmental science and techn	ology, life science,	materia	ls scie	ence a	nd engineering, appli	ed chemistry	

(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 Scie					d Life Science II]			
Schedule number	M44610020	Subject a	rea	Advanced	Required or	Required			
		-		Environmental	elective				
				and Life					
				Sciences					
Time of starting a course	Year	Day of	the	Intensive	Credit(s)	3			
		week,per	od						
	Graduate Program	n tor Maste	rs Degr	ee	Subject grade	2~			
Department Offered	Environmental an	d Life Scier	ices		Beggining grade	MI			
Charge teacher name[Roman	S4系教務委員 4	kei kyomu I	in-S						
alphabet mark]									
Numbering	ENV_MAS65015								
Objectives of class									
Based on the Seminar on Enviro	nmental and Life S	Science I, th	is 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	ks and papers unde	r the guidance of			
his/her supervisor. The student	s will learn the kr	nowledge ar	nd the p	resentation skills re	equired for his/her	research in the			
seminar.									
The students will be required to	read textbooks and	d papers wr	itten by	other language than	Japanese, especia	ally English, which			
are suggested by his/her supervi	sor, and to report a	and discuss	deeply (on his/her research	subject in the semi	nar.			
Self Preparation and Review									
Related subjects									
Seminar on Environmental and Li	fe Science I								
Thesis Research on Environment	al and Life Science		<u>.</u>						
All other relevant subjects in Adv	anced Environmen	tal and Life	Science	S					
Supervisor will recommend texto	ooks, papers, and r	esearch ma	terials to	o students.					
Notes for reference									
Goals to be achieved									
To acquire basic knowledge on a	nvironmontal and lit	fa salanaas							
To understand the contents of so	cientific naners in a	a given field	of envir	onmental and life sci	ences				
To be able to make oral and post	er presentations re	elevant to n	aners he	/she has read	ences				
Evaluation of achievement									
The evaluation is based on the	scores of reading	texthooks ;	and scie	ntific naners discus	sions reports and	presentations of			
his/her research in the seminar.	His/her supervisor	evaluates t	he score	es.					
Examination	•								
試験期間中には何も行わない									
None during exam period									
Details of examination									
Other information									
Supervisor(s)									
Reference URL									
http://ens.tut.ac.jp/en/									
Office hours									
Students are encouraged visiting	Students are encouraged visiting by appointment.								
Relations to attainment objective	es of learning and e	oducation							
1									
<u> </u>									
Key words									
Environmental science and techn	ology, life science,	materials s	cience a	nd engineering, appli	ed chemistry				

(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	Intensive	Credit(s)	6		
		week,period					
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	1~2		
Department Offered	Environmental and	d Life Sciences		Beggining	M2		
				grade			
Charge teacher name[Roman alphabet mark]	S4系教務委員 4I	kei 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.

Contents of class

The students are 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. **Self Preparation and Review**

Related subjects

Seminar on Environmental and Life Science I

Seminar on Environmental and Life Science II

Notes for textbook

Supervisor 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

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).

Examination

None during exam period

Details of examination

Other information

Supervisor

Reference URL

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

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

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

(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]	Life Science]						
Schedule number	M44610030	Subject area	Advanced	Required or	Required			
			Environmental	elective				
			and Life					
			Sciences					
Time of starting a course	2Years	Day of the	Intensive	Credit(s)	6			
		week,period						
Faculty	Graduate Progran	Graduate Program for Master's Degree Subject grade						
Department Offered	Applied Chemistry	y and Life Science		Beggining	M1, M2			
				grade				
Charge teacher name[Roman	S4系教務委員, 4系各教員 4kei kyomu Iin−S, 4kei kakukyouin							
alphabet mark]								
Numbering	ENV_MAS68015							

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.

Contents of class

The students are 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. **Self Preparation and Review**

Related subjects

Seminar on Environmental and Life Science I

Seminar on Environmental and Life Science II

Notes for textbook

Supervisor 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

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).

Examination

試験期間中には何も行わない

None during exam period

Details of examination

Other information

Supervisor

Reference URL

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

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

Environmental science and technology, life science, materials science and engineering, 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	Intensive	Credit(s)	6		
Faculty	Graduate Program	Graduate Program for Master's Degree Subject grade					
Department Offered	Environmental and	d Life Sciences	Beggining grade	M2			
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4	4系各教員 4kei kyor	mu Iin−S, 4kei kakuk	youin			
Numbering	ENV_MAS68015						

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.

Contents of class

The students are 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. **Self Preparation and Review**

Related subjects

Seminar on Environmental and Life Science I

Seminar on Environmental and Life Science II

Notes for textbook

Supervisor 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

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).

Examination

試験期間中には何も行わない

None during exam period **Details of examination**

Other information

Supervisor(s)

Reference URL

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

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

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

(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]							
Schedule number	M44610040	Subject area	Advanced	Required or	Required			
		_	Environmental	elective				
			and Life					
			Sciences					
Time of starting a course	Year	Day of the	Intensive	Credit(s)	6			
		week,period						
Faculty	Graduate Program	n for Master's Deg	ee	Subject grade	2~			
Department Offered	Environmental an	d Life Sciences		Beggining	M1			
				grade				
Charge teacher name[Roman	S4系教務委員 4	kei kyomu Iin−S						
alphabet mark								
Numbering	ENV_MAS65015							
Objectives of class								
This course will provide the stu	udents with the op	portunity to study	on his/her researd	h subject in enviro	onmental and life			
sciences by reading textbooks a	nd papers under the	e guidance of his/h	er supervisor. The st	udents will learn th	ne knowledge and			
the presentation skills required f	or his/her research	in the seminar.						
Contents of class								
The students will be expected	to read textbooks	s and papers writ	en by foreign langu	age that are indic	cated by his/her			
supervisor, and report and discus	ss deeply on his/he	r research subject	in the seminar.					
Self Preparation and Review								
Related subjects								
Thesis Research on Environment	al and Life Science	ł						
All other relevant subjects in Ad	vanced Environmen	tal and Life Scienc	26					
Notes for textbook								
Supervisor will recommend texth	ooks and papers to	students						
Notes for reference		students.						
Or all to be exhland								
I o acquire basic knowledge on e	nvironmental and lif	e sciences						
To understand the contents of s	cientific papers in a	given field of envi	onmental and life sci	ences				
To be able to make oral and post	ter presentations re	elevant to papers he	e/she has read.					
Evaluation of achievement								
The evaluation is based on the	scores of reading	papers, discussion	s, reports and prese	ntations of his/hei	r research in the			
seminar. His/her supervisor eval	uates the scores.							
試験期間中には何も行わない								
None during exam period								
Details of examination								
Other information								
Supervisor								
Reference URL								
http://ens.tut.ac.jp/en/								
Office hours								
Students are encouraged visiting by appointment.								
Relations to attainment objectives of learning and education								
Key words								

(M44630070)Advanced Polymer Chemistry[Advanced Polymer Chemistry]

Subject name[English]	Advenced Delvine	au Chamaiatur (Advan	and Daluman Chamin	t			
	Auvariced Polymo			uryj De me'	Els at		
Schedule number	W144630070	Subject area	Advanced	Required or	Elective		
			Environmental	elective			
			and Life				
			Sciences				
Time of starting a course	Fall1 term	Day of the	Thu.3~3	Credit(s)	1		
		week,period					
Faculty	Graduate Program	m for Master's Degre	ee	Subject grade	1~		
Department Offered	Environmental an	id Life Sciences		Beggining	M1		
A				grade			
Charge teacher name Roman	伊津野 具一,原	口 直樹 ITSUNO S	hinichi, HARAGUCHI	Naoki			
alphabet mark							
Numbering	ENV_MAS52225						
Objectives of class							
This course focuses on the synth	netic aspects of po	lymer-supported ch	emistry. Several app	lications of solid-s	upported organic		
chemistry will be discussed.							
Contents of class							
(1) Preparation of functionalized	monomers						
(2) Preparation method of polyme	er-support						
(3) Preparation of functional poly	mers by polymer re	eaction method					
(4) Preparation of functional poly	mers by polymeriza	ation method					
(5) Nucleophilic reactions on the	functional notwork						
(6) Electrophilic reactions on the	e functional polymer						
(7) Delymer-supported reagonts		515					
(7) Polymer-supported reagents							
(6) Polymer-supported catalysts	human an an an antara a	atalvat					
(9) Asymmetric reaction using po	iymer-supported c	atalyst					
(10) Solid phase peptide synthe	esis						
Self Preparation and Review							
Related subjects							
Organic Chemistry							
Polymer chemistry							
Notes for textbook							
No textbook will be used.							
Notes for reference							
Goals to be achieved							
1) To understand radical polymer	ization of vinvl mo	nomers					
2)To understand reactions of po	lvmers						
3)To understand the synthesis of optically active polymers							
4) To understand the structure formation of pentides and proteins							
Evaluation of achievement							
The report on selected topics will	l be imposed						
	r be impeded.						
Examination							
Details of eventsetien							
Details of examination							
Other information							
6010							
0013							
itauna@ana tut a - in							
itsuno@ens.tut.ac.jp							
itsuno@ens.tut.ac.jp							

6812 haraguchi@ens.tut.ac.jp

Reference URL

http://ens.tut.ac.jp/chiral/index.html

Office hours

Any time

Relations to attainment objectives of learning and education

Key words

Polymer reaction, Optically active polymers, Polymeric catalyst, Asymmetric reactions, Peptide

(M44630080)Advanced Polymer Engineering[Advanced Polymer Engineering]

Subject name[English]	Advanced Polymer Engineering[Advanced Polymer Engineering]						
Schedule number	M44630080	Subject a	area	Advanced	Required or	Elective	
				Environmental	elective		
				and Life			
				Sciences			
Time of starting a course	Fall2 term	Day of week per	f the	Tue.2~2	Credit(s)	1	
Faculty	Graduate Program	n for Maste	er's Degr	ee	Subject grade	1~	
Department Offered	Environmental an	d Life Scier	nces		Beggining	M1	
					grade		
Charge teacher name[Roman	吉田 絵里 YOSH	IIDA Eri			0.000		
alphabet mark]							
Numbering	ENV_MAS52215						
Objectives of class							
1 To acquire knowledge of a	dvanced polymer	syntheses	includir	well-controlled n	olymerizations and	heterogeneous	
nolymerizations in supercritical c	arbon dioxide	oynenoooo	moladii				
2 To understand molecular self-	assembly in vivo an	nd in vitro					
Contents of class							
Contents of class							
1 Advanced polymer syntheses							
1) Controlled radical polymerizati	on 1						
2) Controlled radical polymerizati	on 2						
3) Molecular design through living	radical polymeriza	tion					
4) Heterogeneous polymerization	e						
5) Polymerization in supercritical	oarbon dioxide						
5) Polymenzation in supercritical							
2. Molecular self-assembly							
1) Theory of molecular self-asse	mbly in vitro						
2) Theory of molecular self-asse	mbly in vivo						
3) Supramolecular chemistry							
Self Preparation and Review							
Related subjects							
Notes for textbook							
No textbook is needed.							
Notes for reference							
Goals to be achieved							
To understand cutting-edge tech	nology based on w	ell-defined	nolymer				
Evaluation of achievement	nology based on w	cii defined	porymen	5.			
Report submission each time							
Eveningtion							
D小 中C 关加 By Papart							
iy report							
Other information							
Reference URL							
Office hours							
Available at anvtime							
Relations to attainment objective	as of learning and ϵ	ducation					

Key words

Controlled/living radical polymerization, Molecular self-assembly, Supramolecular chemistry

(M44630120)Advanced Molecular Life Science[Advanced Molecular Life Science]

Subject name[English]	Advanced Molecu	ılar Life S	Scienc	e[Ad	vanced Molecular Lif	e Science]	
Schedule number	M44630120	Subjec	t area	1	Advanced	Required or	Elective
		_			Environmental	elective	
					and Life		
					Sciences		
Time of starting a course	Fall1 term	Day	of	the	Thu.2~2	Credit(s)	1
		week,p	eriod				
Faculty	Graduate Program	n for Mas	ster's	Degre	e	Subject grade	1~
Department Offered	Environmental an	d Life Sc	ience	s		Beggining	M1
Ohanna haadhan aan (Daman		含비 ㅜ ʌ ʌ ৷		г		grade	
Charge teacher name_Roman	田中 忠連, 御家	启JIAN	AKA	i erun	NCNI, UNIERAGE 50		
Numbering	ENIV MAS53225						
	2111 _111 1000220						
This source will provide stude	ata with the anna	unter constant of the		ما الم	ant impactant was	anala manana an I	
This course will provide studen	its with the oppo	rtunity t	o rea	a rea	ent important rese	earch papers on r	RINA engineering.
appropriate the second subjects your	re NOT qualified t	for this	ury an		ecular biology is ab	solutely necessary	of two or three
completed triese subjects, you a	are NOT qualified		Jourse	5. Trie		e the presentation	of two or three
This course will provide stude	ate with the oppo	rtunity t	o rea	d rad	ent important rese	arch naners on l	2NA engineering
Therefore the knowledge of has	ic histechnology h	iochemis	trv an	d mo	lecular biology is ab	solutely necessary	If you have not
completed these subjects you	are NOT qualified t	for this d		⊾ Th	students will make	the presentation	of two or three
research papers			500130	. III	s students will make		
Contents of class							
No Lecture							
This Class goes with the "Origin	al Papers" of the	recent R	NA e	ngine	ering published in th	e Nucleic Acids R	esearch At first
students must access the HP of	Nucleic Acids Rese	arch htt	n'/n	ar oxf	ordiournals org/		
Next, pick two or more good rese	arch papers publish	ned after	2015	in th	e Nucleic Acids Rese	earch.	
After that, every student will give	e a presentation o	f the ch	osen r	baper	Students will be gi	ven 20 min for the	presentation. In
that duration, the student must e	xplain plainly, but t	hroughou	it the	nove	ty of the research.		
					- ,		
Nolecture							
This Class goes with the "Origin	al Papers" of the	recent R		ngina	aring published in th	e Nucleic Acids R	esearch At first
students must access the HP of	Nucleic Acids Rese	arch htt	n / / n	ar ovf	ordiournals org/	IE MUCIEIC ACIUS IN	esearon. At hist,
Next nick two or more good rese	arch naners nublis	hed after	2015	in th	e Nucleic Acids Res	arch	
After that every student will give	e a presentation o	f the ch	osen r	naner	Students will be gi	ven 20 min for the	presentation In
that duration, the student must e	xplain plainly, but t	hroughou	it the	nove	tv of the research.		
					,		
Self Preparation and Review							
A detailed course outline will be	handed out on the f	First dav					
A detailed course outline will be	handed out on the f	First day.					
Related subjects		not day.					
Biotechnology, molecular biology							
Biotechnology, molecular biology							
Notes for textbook							
Notes for reference							
Ocele to be exhibited							
		4 l . !					
At the end of the course, particip	bants are expected	to explai	n the	recer	It progress of RINA e	engineering.	
Evaluation of application	ants are expected	to expiai	n trie	recer	IL PLOGLESS OF RINA 6	ngneering.	
Attendance and attitude (20%)							
$\Delta $ (20%)							
Attendance and attitude (20%)							
Presentation (80%)							
Framination							
その他							
Other							
0000							

Details of examination

Other information

So Umekage: ex.6917, umekage@ens.tut.ac.jp, G-402 So Umekage: ex.6917, umekage@ens.tut.ac.jp, G-402 **Reference URL**

Office hours

Please make an appointment. Please make an appointment.

Relations to attainment objectives of learning and education

(C)理論的・応用的知識の獲得と発展的活用能力 重要な学術・技術分野の理論・応用知識を自発的に獲得し,発展的に活用できる能力

Key words

RNA, biotechnology, molecular biology RNA, biotechnology, molecular biology

(M44630210)Advanced Life Science and Biotechnology I[Advanced Life Science and Biotechnology I]

Subject name[English]	Advanced Life Sc	ience and Bi	otechn	ology I[Advanced Lif	e Science and Biot	echnology []		
Schedule number	M44630210	Subject an	ва	Advanced	Required or	Elective		
		-		Environmental	elective			
				and Life				
				Sciences				
Time of starting a course	Fall term	Day of	the	Intensive	Credit(s)	2		
		week,perio	d					
Faculty	Graduate Program	n for Master'	s Degr	ee	Subject grade	1~		
Department Offered	Environmental and	d Life Scienc	es		Beggining	M1		
Oberen teacher news[Demon	€4玄扮致禾昌 4	kai kuannu Tin	_6		grade			
charge teacher name_Roman	34 示 叙 伤 女 貝 4	kei kyönnu in	-3					
Numbering	FNV MAS53225							
Objectives of class								
This source will provide the stud	onto with the onno	rtunity to ct	idv on	calected subjects in	the realm of adva	nood life science		
and biotechnology	ents with the oppo		uuy on	selected subjects in	the realition auva	nceu me science		
and biotechnology.								
Contonto of alass								
The classes will be given by his	her supervisor Th	a ctudanta ::	ill ha r	aquired to read test	books and nana	but the type and		
contents of this course depend a	ner supervisor. In n his/her supervisor	e students M or	ni be r	equired to read text	books and papers	but the type and		
contents of this course depend of	in his/her supervise	JI.						
Solf Dresseration and Deview								
Ser Preparation and Review								
Related subjects								
Advanced Life Science and Biote	chnology II							
Notes for textbook								
Supervisor will recommend textb	ooks and papers to	students.						
Notes for reference								
Goals to be achieved								
To acquire advanced knowledge	on life science and	biotechnolog	У					
To be able to report and discuss	the contents of tex	xtbooks and	papers	he∕she has read.				
Evaluation of achievement								
The evaluation is based on the se	cores of reports, pr	esentations,	and ex	amination.				
Examination								
試験期間中には何も行わない								
None during exam period								
Details of examination								
Other information								
Office hours								
Students are encouraged visiting	by appointment.							
Relations to attainment objective	es of learning and e	ducation						
Key words								
Life science biotochnology bioto	ginopring malacula	r biology mi	proble	mu renomico				
Life science, biotechnology, bloer	igineering, molecula	ar Diology, mi	ropiolo	ogy, genomics				

(M44630230)Advanced Environmental Technology I[Advanced Environmental Technology I]

Subject name[English]	Advanced Enviro	nmental Technology	I[Advanced Environ	mental Technology	I]		
Schedule number	M44630230	Subject area	Advanced	Required or	Elective		
			Environmental	elective			
			and Life				
			Sciences				
Time of starting a course	Fall term	Day of the	Intensive	Credit(s)	2		
		week,period					
Faculty	Graduate Progra	m for Master's Degre	ee	Subject grade	1~		
Department Offered	Environmental ar	nd Life Sciences		Beggining	M1		
	。 • 五 松 水 千 日 ·			grade			
Charge teacher name[Roman	S4糸教務安員4	ikei kyomu lin-S					
alphabet mark							
	ENV_MAS04220						
Objectives of class							
This course will provide the st	udents with the	opportunity to stud	y on the selected	subject in the rea	alm of advanced		
environmental science and techn	ology.						
	// ·						
The classes will be given by his/	ner supervisor. Ir	ne students will be r	equired to read text	books and papers	but the type and		
Solf Properation and Paview	on his/her supervis	or.					
Self Preparation and Review							
Related subjects							
Advanced Environmental Techno	logy II						
Notes for textbook	10g y						
Supervisor will recommend textb	ooks and papers to	students					
Notes for reference							
Goals to be achieved							
To acquire advanced knowledge	on environmental s	cience and technolo	gy				
To be able to report and discuss	the contents of te	extbooks and papers	he∕she has read.				
Evaluation of achievement							
The evaluation is based on the se	cores of reports, p	resentations, and ex	amination.				
Examination							
試験期間中には何も行わない							
None during exam period							
Details of examination							
Other information							
Supervisor							
Reference URL							
Office hours							
Students are encouraged visiting by appointment.							
Relations to attainment objectives of learning and education							
Key words							
Environmental science, environm	ental technology, e	eco-technology, envi	ronmental engineerir	ng			

(M44630250)Advanced Environmental and Ecological Systems I[Advanced Environmental and Ecological Systems I]

Studget nameLingtaint) Advanced Environmental and Ecological Systems II. (Advanced Environmental Ecological Ecological Systems II. (Advanced Environmental Ecological Systems II. (Advanced Environmental Ecological Ecological Systems II. (Advanced Environmental Ecological Ecological Ecological Systems II. (Advanced Ecological			· · · · · · · · · · · · · · · · · · ·					
Systems I) Subject area and Life Sciences Advanced and Life Sciences Required elective Clective elective Time of starting a course Fall term Day of the wesk,paried Intensive Credit(s) 2 Faculty Graduate Program for Master's Degree Subject grade 1~ Department Offered Environmental and Life Sciences Begginne grade M1 Ohargo teacher name(Roman alphabet mark) S4系数落度具 4kei kyomu lin-S Begginne grade M1 Numbering ENV/MASS4125 Objectives of class Intervision of advanced anvironmental and ecological systems. Intervision of advanced subject in the realm of advanced subject in the realm of advanced subject in the realm of advanced subject in the course of plane on his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course depend on his/her supervisor. Soft Progration and Review Related aubjects Subject sectors Subject sectors Notes for reference Goals to be achieved to acquire advanced knowledge on environmental science and textbooks and papers he/she has read. Subject sectors Subject sectors Subject reference URL Office hours Subject reference URL Subject reference URL Subject reference URL Subject refer	Subject name[English]	Advanced Environmental and Ecological Systems ILAdvanced Environmental and Ecologica						
Schedule number M44630250 Subject area and automatial and automatial and automatial sciences Required or elective Elective Time of starting a course Fail term Upy of the weakparied Intensive Credit(a) 2 Faculty Graduate Program for Matter's Degree Subject grade 1~ Department Offered Environmental and Life Sciences Beggining grade M1 Charge teacher name[Channa sphate math] SA%数数度具 Klei kyonu lin-S sphate math] Beggining grade M1 Numbering ENV.MAS51125 Upiectives of lase Intensive Faculty on the selected subject in the realm of advanced environmental and ecological systems. The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and ontents of this ourse depend on his/her supervisor. Sef Progration and Review Related aukjects Intensition of advanced knowledge on environmental science and technology and ecological systems. Intensition To a capaire advanced knowledge on environmental science and technology and ecological systems. Intensition Supervisor will recomment textbooks and papers to students. Intensition Supervisor will recomment be scores of reports, presentations, and examination. Intensition		Systems I						
Image: Section and Sectin and Section and Section and Section and Section and	Schedule number	M44630250	Subject area	Advanced	Required or	Elective		
Image: Contract of the starting a course Fail term Day of the sciences Intensive Credit(s) 2 Faculty Graduate Program for Master's Degree Subject grade 1~ Department Offered Environmental and Life Sciences Beggining grade 1~ Numbering ENV_MAS54125 Beggining grade M1 Objectives of class Numbering ENV_MAS54125 Sciences Beggining grade M2 Objectives of class This course will provide the students with the opportunity to study on the selected subject in the realm of advanced environmental and ecological systems. Contents of class Master's Degree Sciences Science Sciences Sciences Science Sciences Science Science Science Science Science Science Scien addition Science				Environmental	elective			
Sciences Credit(s) 2 Time of starting a course Fail term Dey of the wek,pariod Intensive Credit(s) 2 Faculty Graduate Program for Master's Degree Subject grade 1~ Department Offered Environmental and Life Sciences Beagining grade 1~ Charge teacher name[Roman shiphabet mark] SA系教務委員 4kei kyonu lin-S grade 1~ Numbering ENV.MAS54125 Unable of the subject in the realm of advanced environmental and celosigical systems. The course will provide the students with the opportunity to study on the selected subject in the realm of advanced environmental and celosigical systems. Selecter subjects Selecter subjects Selecter subject in the realm of advanced environmental science and technology and ecological systems. Notes for taxbook Supervisor will recomment textbooks and papers to students. Notes for reference Selecter subject in the selecter subject in the selecter systems. Selecter subject in the selecter subject in the type and contents of textbook. Supervisor will recomment textbooks and papers to students. Notes for reference Selecter subject in the selecter subject in the realm of advanced involvement To acquire advanced knowledge on environmental science and technology and ecological systems. Selecter subject in the selecter s				and Life				
Time of starting a course Fall term Day of the weekpariod Intensive Credit(s) 2 Faculty Graduate Program for Master's Degree Subject grade 1~ Department Offered Environmental and Life Sciences Beggining grade M1 Otharge teacher name[Roman S4乘教務委員 4kei kyonu lin-S alphabet mmk] Intensive Beggining grade M1 Numbering ENV_MAS54125 Objectives of class Intensive Intensive Objectives of class This course will provide the students with the opportunity to study on the selected subject in the realm of advanced environmental and ecological systems. Software for the selected subject in the realm of advanced environment and ecological systems. Related subjects Self Preparation and Review Selected subject Notes for reforence Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read Evaluation of advanced Evaluation of advanced of classered Evaluation is based on the scores of reports, presentations, and examination. Evaluation of advanced Evaluation of advanced of samination Subgrillint is based on the scores of reports, presentations, and examination. Evaluat				Sciences				
Number of the state	Time of starting a course	Fall term	Dav of the	Intensive	Credit(s)	2		
Faculty Graduate Program for Master's Degree Subject grade 1~ Department Offered Environmental and Life Sciences Beggining grade M1 Otherse teacher name[Roman alphabet mark] S4系教務委員 4kei kyomu lin-S M1 M1 Subject grade Environmental and Life Sciences Beggining grade M1 Objectives of class ENV_MAS54125 ENV_MAS54125 Subject grade Master's Degree This course will provide the students with the opportunity to study on the selected subject in the realm of advanced anvironmental and acological systems. Gordente of class The classes will be given by his/her supervisor. The classes Beggining Invironmental and ecological systems. Subject grade Subject grade<			week period					
Department Offered Environmental and Life Sciences Beggining grade M1 Charge teacher name[Roman alphabet mark] S4条教務委員 4kei kyomu lin-S M1 Numbering ENV_MAS54125 Objectives of class model This course will provide the students with the opportunity to study on the selected subject in the realm of advanced environmental and ecological systems. other supervisor. Selectives of class Contents of class The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course degrad on his/her supervisor. Selective advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Selective advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Selective advanced knowledge on environmental science and technology and ecological systems To be able to seam period Selective advanced knowledge on environmental science and technology and ecological systems To be able to seam period Selective advanced knowledge on environmental science and technology and ecological systems To be able to seam period Selective advanced knowledge on environmental science and examination. Evaluation is based on the scores of reports, presentations, and examination. Selective advanced knowledge on environmental science advanced knowledge advanced knowledge on the/	Faculty	Graduate Progra	m for Master's Degr	20	Subject grade	1~		
Department of view Dimensional and Enc Conductors Depart grade Init and Charge teacher name[Roman] S4系教教養員 4kei kyomu lin-S alphabet mark] Aumbering ENV_MASS4125 Objectives of class This course will provide the students with the opportunity to study on the selected subject in the realm of advanced environmental and ecological systems. Contents of class The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course depend on his/her supervisor. Self Preparation and Review Related subjects Notes for textbook Supervisor will recommend textbooks and papers to students. Notes for reference Orabin to its based on the scores of reports, presentations, and examination. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Example Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Example Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Example Other information Supervisor Supervisor Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education	Department Offered	Environmental a	nd Life Sciences		Beggining	M1		
Charge teacher name[Roman alphabet mark] Numbering ENV_MASS4125 Objectives of class This course equivale the students with the opportunity to study on the selected subject in the realm of advanced environmental and ecological systems. Contents of class The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course depend on his/her supervisor. Self Preparation and Review Related subjects Notes for textbook Supervisor will recommend textbooks and papers to students. Notes for reference Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination Supervisor WIL None during exam period Details of examination Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	Boparanone onorou	Environmentaria			made			
Charge texture maniptional S ***********************************	Ohanna taaahan nama[Daman	C/ √ 払 払 払 私 品	Aleai la comu lin-S		giauo			
apprace marking ENV_MAS54125 Diportives of class This course will provide the students with the opportunity to study on the selected subject in the realm of advanced environmental and ecological systems. Contents of class The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course depend on his/her supervisor. Self Proparation and Review Related subjects Notes for textbook Supervisor will recommend textbooks and papers to students. Notes for reference Coals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination Supervisor WIL Coffice hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	Charge Leacher name_roman	34宋秋彻女員	4ker kyönnu inn-3					
Numbering Disotives of class This course will provide the students with the opportunity to study on the selected subject in the realm of advanced environmental and ecological systems. Contents of class The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course depend on his/her supervisor. Self Preparation and Review Related subjects Notes for textbook Supervisor will recommend textbooks and papers to students. Notes for reference Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation is based on the scores of reports, presentations, and examination. Examination 試験期間中には何も行わない None during exam period Details of examination Other information Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows								
Objectives of class This course will provide the students with the opportunity to study on the selected subject in the realm of advanced environmental and ecological systems. Contents of class The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course depend on his/her supervisor. Self Preparation and Review Related subjects Notes for reference Goals to be achieved To a capire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination Add #ff Aff Aff Aff Aff Aff Aff Aff Aff Aff	Numbering	EINV_WAS54125						
This course will provide the students with the opportunity to study on the selected subject in the realm of advanced environmental and ecological systems. Contents of class The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course depend on his/her supervisor. Self Proparation and Review Related subjects Notes for textbook Supervisor will recommend textbooks and papers to students. Notes for reference Coals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination 체용期时中仁仁有气行为ない None during exam period Details of examination Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	Objectives of class							
environmental and ecological systems. Contents of class The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course depend on his/her supervisor. Self Preparation and Review Related subjects Notes for textbook Supervisor will recommend textbooks and papers to students. Notes for reference Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation is based on the scores of reports, presentations, and examination. Examination 武敏期間中には何行わない None during exam period Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	This course will provide the st	udents with the	opportunity to stud	y on the selected	subject in the rea	alm of advanced		
Contents of class The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course depend on his/her supervisor. Self Preparation and Review Related subjects Notes for textbook Supervisor will recommend textbooks and papers to students. Notes for reference Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation is based on the scores of reports, presentations, and examination. Examination Subgriffiel + Cl_{40} + 474 xb_1 \rightarrow None during exam period Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	environmental and ecological sys	tems.						
The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course depend on his/her supervisor. Self Preparation and Review Related subjects Notes for toxtbook Supervisor will recommend textbooks and papers to students. Notes for reference Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination 武陵期間中には何も行わない None during exam period Details of examination Cother information Supervisor Reference URL Coffice hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	Contents of class							
contents of this course depend on his/her supervisor. Self Preparation and Review Related subjects Notes for textbook Supervisor will recommend textbooks and papers to students. Notes for reference Coals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination Subjective evaluation Details of examination Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	The classes will be given by his	/her supervisor. T	he students will be r	equired to read text	books and papers	but the type and		
Self Preparation and Review Related subjects Notes for textbook Supervisor will recommend textbooks and papers to students. Notes for reference Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination MitkpilliphicLid间右行かない None during exam period Details of examination Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	contents of this course depend of	on his/her supervis	sor.			, · · · ·		
Related subjects Notes for textbook Supervisor will recommend textbooks and papers to students. Notes for reference Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination 武陵期間中には何も行わない None during exam period Details of examination Cher information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	Self Preparation and Review							
Related subjects Notes for textbook Supervisor will recommend textbooks and papers to students. Notes for reference Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation is based on the scores of reports, presentations, and examination. Examination 試験期間中には何も行わない None during exam period Details of examination Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows								
Related subjects Notes for textbook Supervisor will recommend textbooks and papers to students. Notes for reference Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination Sugervisor Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows								
Notes for textbook Supervisor will recommend textbooks and papers to students. Notes for reference Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination Xits期間中には何も行わない None during exam period Details of examination Cupervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	Related subjects							
Notes for textbook Supervisor will recommend textbooks and papers to students. Notes for reference Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination 試験期間中には何も行わない None during exam period Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education								
Supervisor will recommend textbooks and papers to students. Notes for reference Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination Stigs pille the contents of examination Obter information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education	Notes for textbook							
Description Description of state papers to state papers to state papers and state p	Supervisor will recommend texth	ooks and naners to	o students					
Notes to resolute Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination Stigs期間中には何も行わない None during exam period Details of examination Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education	Notes for reference							
Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination 試験期間中には何も行わない None during exam period Details of examination Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows								
Goals to be achieved To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination 試験期間中には何も行わない None during exam period Details of examination Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education								
To acquire advanced knowledge on environmental science and technology and ecological systems To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination Stigs期間中には何も行わない None during exam period Details of examination Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education	Goals to be achieved							
To be able to report and discuss the contents of textbook and papers he/she has read. Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination Stigh期間中には何も行わない None during exam period Details of examination Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	To acquire advanced knowledge	on environmental s	science and technolo	gy and ecological sy	stems			
Evaluation of achievement The evaluation is based on the scores of reports, presentations, and examination. Examination 試験期間中には何も行わない None during exam period Details of examination Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	To be able to report and discuss	the contents of te	extbook and papers h	ie∕she has read.				
The evaluation is based on the scores of reports, presentations, and examination. Examination 試験期間中には何も行わない None during exam period Details of examination Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	Evaluation of achievement							
Examination 試験期間中には何も行わない None during exam period Details of examination Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	The evaluation is based on the se	cores of reports, p	presentations, and example	amination.				
ites 期間中には何も行わない None during exam period Details of examination Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	Fxamination	,,,,,,,						
None during exam period Details of examination Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	試験期間中には何も行わたい							
Note during example rod Details of examination Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	武家が同中により0111/20							
Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	None during exampendu							
Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	Details of examination							
Other information Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows								
Supervisor Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology. materials flows	Other information							
Reference URL Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology. materials flows	Supervisor							
Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology, materials flows	Reference URL							
Office hours Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology. materials flows								
Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology. materials flows	Office hours							
Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education Key words Ecological systems, industrial ecology, environmental technology. materials flows								
Key words Ecological systems, industrial ecology, environmental technology. materials flows	Students are encouraged visiting	by appointment.						
Key words Ecological systems, industrial ecology, environmental technology, materials flows	Relations to attainment objective	as of learning and	education					
Key words Ecological systems, industrial ecology, environmental technology, materials flows								
Key words Ecological systems, industrial ecology, environmental technology, materials flows								
Key words Ecological systems, industrial ecology, environmental technology, materials flows								
Key words Ecological systems, industrial ecology, environmental technology, materials flows								
Key words Ecological systems, industrial ecology, environmental technology, materials flows								
Ecological systems, industrial ecology, environmental technology, materials flows	Key words							
	Ecological systems. industrial eco	ology, environment	al technology. materi	als flows				
(M44630300)Applied Environmental Biology[Applied Environmental Biology]

Subject	Applied Envir	ronmental Bio	logv[A	pplied Environme	- ntal Biolog	vl		
name[English]								
Schedule number	M44630300			Subject area	Advance	d	Required or	Elective
					Environn	nental	elective	
					and Life	Sciences		
Time of starting a	Fall1 term			Day of the	Fri.2~2		Credit(s)	1
course	0	6 M	. , , ,	week,period			<u>.</u>	-
Faculty	Graduate Pro	ogram for Mas	ster's L	Jegree			Subject	1~
Department Offered	Environment	al and Life Se	ionoos				grade Beggining	M1
Department Onered	Environment	ai anu Lite Su	lences	2			grade	
Charge teacher	中鉢 淳 NA	KABACHI Ats	ushi				grade	
name[Roman	121 77 101		aom					
alphabet mark]								
Numbering	ENV_MAS52	225						
Objectives of class								
The aim of this cou	rse is to lea	arn concepts	of w	/hat life is, and	how we	can use	the knowledg	e of biology in
environmental/agricultu	iral sciences.							
The aim of this cou	rse is to lea	arn concepts	of w	hat life is, and	how we	can use	the knowledg	e of biology in
environmental/agricultu	iral sciences.							
Contents of class								
1st week:Biodiversity a	and evolution							
2nd week:Prokaryotic	genomes							
3rd week:Eukaryotic ge	enomes							
4th week:Plant-microb	e interactions							
5th week:Agricultural p	ests and disea	ises						
6th week:Integrated pe	est managemen	nt						
7th week:Genetically m	nodified crops							
8th week:Summary								
1st week:Biodiversity a	and evolution							
2nd week : Prokaryotic	genomes							
3rd week:Eukaryotic ge	enomes							
4th week:Plant-microb	e interactions							
5th week:Agricultural p	ests and disea	ises						
6th week:Integrated pe	est managemen	nt						
7th week:Genetically m	nodified crops							
8th week:Summary								
Self Preparation and R	eview							
No preparation is requir	red, but after c	lass review o	f hand	outs is highly rec	ommended	l.		
No preparation is require	red, but after c	lass review o	f hand	outs is highly rec	ommended			
Related subjects								
Notes for textbook								
No textbooks are requi	red.							
No textbooks are requi	red.	1					r.	
Reference1	Book title	Molecular E	liology	of the Cell			ISBN	978-
				<u> </u>	-			0815344643
	Author	Bruce Al	oerts	Publisher	Garland	Science	Publish	2014
		et al.					year	
Reference2	Book title	Evolution					ISBN	978-
								0879696849
	Author	Nicholas	H.	Publisher	Cold	Spring	Publish	2007

		Barton et al.		Harbor	year				
				Laboratory Press					
Reference3	Book title	Plant Physiology			ISBN	978- 0878935659			
	Author	Lincoln Taiz, Eduardo Zeiger	Publisher	Sinauer Associates Inc.	Publish year	2010			
Notes for reference									
Coole to be achieved									
(1) Understand the ser	agent of avalut	ion and higdiversity							
(1) Onderstand the con (2) Con explain how co		lon and blouiversity.							
(2) Can explain now ge	nomes are ana	iyzeu. rokoructio and aukor	avotio ronomoo						
(3) Can ten trie unieren	rice between pr	rokaryotic and eukar	your genomes.						
(4) Know important an		and diseases							
(6) Understand the cor	cultural pests	and useases.	nt						
(7) Understand the tec	hology for de	veloping genetically	modified crops						
	innology for de	veloping genetically	moumed crops.						
(1) Understand the cor	ncept of evolut	ion and biodiversity.							
(2) Can explain how ge	nomes are ana	lyzed.							
(3) Can tell the differen	nce between pi	rokaryotic and eukar	yotic genomes.						
(4) Know various biolog	gical interaction	ns.							
(5) Know important agr	ricultural pests	and diseases.							
(6) Understand the cor	ncept of integra	ated pest manageme	ent.						
(7) Understand the tec	hnology for de	veloping genetically	modified crops.						
Evaluation of achieven	nent								
Achievements are eval	uated by essay	/s/term papers.							
Grade: Score range									
A: 80-100									
B: 65-79									
C: 55-64									
D: 0-54									
Achievements are eval	uated by essay	/s/term papers.							
Grade: Score range									
A: 80-100									
B: 65-79									
C: 55-64									
D: 0-54									
Ltraininauon しポートで実施									
By Report									
Details of examination									
Other information									
Reference URL									
Office hours									
Emails are welcome.	Emails are welcome.								
Emails are welcome.									
Relations to attainmen	t objectives of	f learning and educa	tion						
Kev words									
evolution. biodiversity	genomes biolo	gical interactions a	griculture						
evolution, biodiversity,	genomes, biolo	gical interactions, a	griculture						

(M44630350)Environmental Fluid Dynamics[Environmental Fluid Dynamics]

Subject name[English]	Environmental Flu	uid Dynamics[Enviro	nmental Fluid Dynam	pice]	
Schedule number	M44630350		Advanced	Required or	Elective
	M44030330	Subject area	Environmental	elective	LIEGUVE
			end life	01001140	
			Solonooo		
Time of starting a source	Foll2 torm	Day of the	Mon 2~2	Credit(a)	1
Time of starting a course	Fallz term	Day of the	WION.2~2	Great(s)	1
Feaulty	Graduate Program	for Master's Degre		Subject made	1~
Department Offered	Environmental an	d Life Sciences		Subject grade	M1
Department Onered				made	
Charge teacher name[Roman	宙海林 老去 TOI	KAIRIN Takavuki		graue	
onarge ceacher name_roman	米海小 チキ 10				
	ENIV MAS5/225				
	LINV_INIA334223				
		=		6 .1	
This course mainly focus on env	ironmental fluid suc	ch as the Earth's at	mosphere. The aim	of the course is to	understand how
the motion of atmosphere can be	expressed by basic	c physics laws (cons	servation laws, thern	nodynamics of fluid).
This course mainly focus on env	ironmental fluid suc	ch as the Earth's at	mosphere. The aim	of the course is to	understand how
the motion of atmosphere can be	expressed by basic	c physics laws (cons	servation laws, thern	nodynamics of fluid).
Contents of class					
1st: Introduction					
2nd: Basic conservation laws (1)					
3rd: Basic conservation laws (2)					
4th: Thermodynamics of atmosph	ere				
5th: Circulation and vorticity equ	ation				
6th: Energy equation					
7th: Hamiltonian system in contir	uum mechanics				
8th: Conclusion					
1st: Introduction					
2nd: Basic conservation laws (1)					
3rd: Basic conservation laws (2)					
4th: Thermodynamics of atmosph	ere				
5th: Circulation and vorticity equ	ation				
6th: Energy equation					
7th: Hamiltonian system in contir	uum mechanics				
8th: Conclusion					
Self Preparation and Review					
Related subjects					
Math (differential equation, vecto	r analysis etc), phy	sics (mechanics, flui	d mechanics)		
Math (differential equation, vecto	r analysis etc), phy	sics (mechanics, flui	id mechanics)		
Notes for textbook					
The lecturer distributes handouts					
The lecturer distributes handouts					
Notes for reference					
O ale ta ha ashianad					
This course aims to understand t	he Earth's atmosph	ieric motion using fu	indamental fluid dyna	amics. We will main	ly focus on:
•the conservation laws of mass,	momentum and ene	rgy for atmosphere.			
•thermodynamics of atmosphere					
 circulation, vorticity equation 					
This course aims to understand t	he Earth's atmosph	eric motion using fu	ındamental fluid dyna	amics. We will main	ly focus on:
•the conservation laws of mass,	momentum and ene	rgy for atmosphere.			
 thermodynamics of atmosphere 					
 circulation, vorticity equation 					
Evaluation of achievement					
Students who attend all classes	will be evaluated as	follows:			
A: Achieved all goals and obtaine	d total points of rep	oorts, 80 or higher (out of 100 points).		

B: Achieved 65% of goals and obtained total points of reports, 65 or higher (out of 100 points).

C: Achieved 55% of goals and obtained total points of reports, 55 or higher (out of 100 points).

Students who attend all classes will be evaluated as follows:

A: Achieved all goals and obtained total points of reports, 80 or higher (out of 100 points).

B: Achieved 65% of goals and obtained total points of reports, 65 or higher (out of 100 points).

C: Achieved 55% of goals and obtained total points of reports, 55 or higher (out of 100 points).

Examination

レポートで実施 By Report

Details of examination

Report

Report Other information

Room #G-405, tokairin@ens.tut.ac.jp Room #G-405, tokairin@ens.tut.ac.jp

Reference URL

Office hours

Anytime, but reservation is desirable. Anytime, but reservation is desirable.

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]

			ч <u>г</u> і то				
Subject name[English]	Seminar on Architecture and Givil Engineering ILSeminar on Architecture and Givil						
	Engineering I				1		
Schedule number	M45610010	Subject area	Advanced	Required or	Required		
			Architecture	elective			
			and Civil				
			Engineering				
Time of starting a course	Year	Day of the	Intensive	Credit(s)	3		
_		week,period					
Faculty	Graduate Progra	m for Master's Degre	ee	Subject grade	1~		
Department Offered	Architecture and	d Civil Engineering		Beggining	M1		
				grade			
Charge teacher name[Roman	C5 玄教 務委員	5kei kvomu Iin-S		8.000			
olabobot mork]	00米我初安員、						
	ADC MASS1025						
Numbering	AI(0_10A331023						
Objectives of class							
All the students are required to	attend all the sen	ninars, which is arrar	nged by the laborate	ory supervisor for	the special study		
subjects related to the current re	esearch activity of	the laboratory. The	scheduled program o	of the seminars is a	announced by the		
supervisor at the guidance of the	seminar.						
Contents of class							
Salf Properation and Poview							
Sen Preparation and Review							
Related subjects							
Notes for textbook							
Notes for textbook							
Notes for reference							
Goals to be achieved							
Evaluation of achievement							
Report							
Examination							
その他							
Other							
Details of examination							
Other Information							
Reference URL							
Office hours							
Office flours							
Relations to attainment objective	s of learning and	education					
1							
Key words							
Noy Worus							

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

Subject name[English]	Seminar on Ar	chitecture and Civ	il Engineering II[So	eminar on Archit	ecture and Civil
	Engineering II]				
Schedule number	M45610020	Subject area	Advanced	Required or	Required
			Architecture	elective	
			and Civil		
			Engineering		
The fate the	X	Due of the	Engineering	0	0
lime of starting a course	Year	Day of the	Intensive	Gredit(s)	3
		week,period			-
Faculty	Graduate Progra	m for Master's Degre	ee	Subject grade	2~
Department Offered	Architecture and	d Civil Engineering		Beggining	M1
Charge teacher name[Roman	S5系教務委員	5kei kvomu lin-S		8.440	
onargo teacher name_roman	00米我初安員、				
Numbering	ARC_WASJ102J				
Objectives of class					
All the students are required to	attend all the sem	ninars, which is arrar	nged by the laborate	ory supervisor for	the special study
subjects related to the current re	esearch activity of	the laboratory. The	scheduled program	of the seminars is	announced by the
supervisor at the guidance of the	seminar.				
Contents of class					
0 KD ID .					
Self Preparation and Review					
Related subjects					
-					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
Report					
Examination					
その他					
での 他					
Other					
Details of examination					
Other information					
D.C. IDI					
Reference URL					
Office hours					
Deletione to etteinment altration		- durantian			
Relations to attainment objective	s or learning and	education			
Key words					

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

Subject name[English]	Thesis Researc	n on Architecture and	Civil Engineering	hesis Research or	Architecture and
	Civil Engineering	g]			
Schedule number	M45610030	Subject area	Advanced	Required or	Required
			Architecture	elective	
			and Civil		
			Engineering		
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Progra	am for Master's Degre	e	Subject grade	1~2
Department Offered	Architecture an	d Civil Engineering		Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S5系教務委員	5kei kyomu Iin-S			
Numbering	ARC_MAS51025	i			
Objectives of class	-				
This thesis research on architect	ure and civil engi	neering is designated	to deepen the know	wledge and enhand	e the skills of the
students in their research fields t	hrough the self-c	riented endeavour wi	th the instruction of	f his/her superviso	or(s).
Contents of class					
The subjects and the contents o	of the thesis vary	depending on the la	boratory. All studer	nts must present	their thesis at the
end of the course and take a fin	al examination or	n the thesis, as a req	uirement for the gr	aduation of the m	aster course. The
study for the thesis is planned an	d conducted und	er the guidance of the	e supervisor(s).		
Self Preparation and Review					
Related subjects					
TBD by the laboratory					
Notes for textbook					
TBD by the laboratory					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
This credit is assigned for all the	process for the p	reparation and prese	ntation of the thesis	S.	
Examination					
その他					
By Report					
Details of examination					
Other information					
Refer to administration office.					
Refer to the URL of each laborate	ory				
Defer to administration office					
Refer to administration office.	o of looming and	a dua attan			
relations to attainment objective	is of learning and	euucation			
1					
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	hesis Research on	Architecture and	
	Civil Engineering					
Schedule number	M45610030	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Required	
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6	
Faculty	Graduate Progra	m for Master's Degre	e	Subject grade	1~1	
Department Offered	Architecture and	Civil Engineering		Beggining grade	M1, M2	
Charge teacher name[Roman alphabet mark]	S5系教務委員,	5系各教員 5kei kyoi	mu Iin−S, 5kei kakuk	youin		
Numbering	ARC_MAS51025					
Objectives of class						
This thesis research on architect	ture and civil engin	eering is designated	to deepen the know	vledge and enhanc	e the skills of the	
students in their research fields t	hrough the self-or	iented endeavour wi	th the instruction of	his/her superviso	r(s).	
Contents of class						
The subjects and the contents o	of the thesis vary	depending on the la	boratory. All studen	ts must present t	neir thesis at the	
end of the course and take a fin	al examination on	the thesis, as a req	uirement for the gr	aduation of the ma	aster course. The	
study for the thesis is planned an	id conducted under	r the guidance of the	supervisor(s).			
Self Preparation and Review						
Related subjects						
TBD by the laboratory						
Notes for textbook						
IBD by the laboratory						
Notes for reference						
Goals to be achieved						
Evaluation of achievement						
This credit is assigned for all the	process for the pr	eparation and presei	ntation of the thesis	·		
Examination その他						
て の 1世 Other						
Details of examination						
Other information						
Refer to administration office.						
Reference URL						
Refer to the URL of each laborat	ory					
Office hours						
Reter to administration office.						
Relations to attainment objectives of learning and education						
Key words						

(M4561003T)Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]

Subject name[English]	Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and						
	Civil Engineering]						
Schedule number	M4561003T	Subject area	Advanced	Required or	Required		
			Architecture	elective			
			and Civil				
			Engineering				
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6		
Faculty	Graduate Program	m for Master's Degre	e	Subject grade	2~2		
Department Offered	Architecture and	Civil Engineering		Beggining	M2		
Charge teacher name[Roman	65玄粉淼秃昌	5. 玄 么 数 旨 5kai kvor	mu lin-S. 5kei kakuk	grade			
alphabet mark]				youn			
Numbering	ARC MAS51025						
Objectives of class							
This thesis research on architect	ure and civil engin	eering is designated	to deepen the know	wledge and enhanc	e the skills of the		
students in their research fields t	brough the self-or	iented endeavour wi	th the instruction of	his/her superviso			
Contents of class					(0).		
The subjects and the contents of	of the thesis vary	depending on the la	boratory. All studen	ts must present t	heir thesis at the		
end of the course and take a fin	al examination on	the thesis as a req	uirement for the gr	aduation of the ma	aster course. The		
study for the thesis is planned an	d conducted under	r the guidance of the	supervisor(s).				
Self Preparation and Review		0					
·							
Related subjects							
Notes for textbook							
Notes for reference							
Goals to be achieved							
Evaluation of achievement							
This credit is assigned for all the	process for the pr	eparation and preser	ntation of the thesis				
Examination							
試験期間中には何も行わない							
None during exam period							
Details of examination							
Other information							
Reference LIDI							
Refer to the LIPL of each laborat	0124						
	ory						
Defer to administration office							
Relations to attainment objective	Refer to administration office.						
	o or loarning and e						
Key words							

(M45610040)Seminar on Architecture and Civil Engineering[Seminar on Architecture and Civil Engineering]

				· · · · · · · · · · · · · · · · · · ·			
Subject name[English]	Seminar on Architecture and Civil Engineering[Seminar on Architecture and Civil						
	Engineering		1				
Schedule number	M45610040	Subject area	Advanced	Required or	Required		
			Architecture	elective			
			and Civil				
			Engineering				
Time of starting a course	Year	Day of the	Intensive	Credit(s)	6		
		week,period					
Faculty	Graduate Progra	m for Master's Degr	ee	Subject grade	2~		
Department Offered	Architecture and	d Civil Engineering		Beggining	M1		
				grade			
Charge teacher name[Roman	S5系数務委員	5kei kvomu lin-S		8			
alphabet mark]	CON MAD &						
Numboring	APC MAS51025						
Objectives of class							
All the students are required to	attend all the ser	ninars, which is arrai	nged by the laborate	ory supervisor for	the special study		
subjects related to the current re	esearch activity of	the laboratory. The	scheduled program of	of the seminars is a	announced by the		
supervisor at the guidance of the	e seminar.						
Contents of class							
In each seminar, students purs	sue several resea	rch topics and/or	undertake projects	collectively and	solely under the		
instruction of the faculty member	rs of the departme	ent and/or those of o	ther departments.				
Self Preparation and Review	·						
Related subjects							
Notes for textbook							
Notes for reference							
Goals to be achieved							
Evolution of achievement							
Report							
Examination							
レポートで実施							
By Report							
Details of examination							
Other information							
Reference URL							
Office hours							
Relations to attainment objective	Relations to attainment objectives of learning and education						
1							
Key words							
-							

(M45630010)Elasticity and Stability[Elasticity and Stability]

Subject	Elasticity and	d Stability[Elasticity a	nd Stability]			
name[English]			1		[
Schedule number	M45630010		Subject area	Advanced	Required or	Elective
				Architecture	elective	
				and Civil		
Time of starting a	F -II +		Dave of the	Engineering		0
lime of starting a	Fall term		Day of the	Tue.3~3	Great(s)	Z
Course Ecoulty	Graduate Pr	ogram for Master's De	week,period		Subject	1~
Faculty	Graduate Fro	ografit for Master's De	gree		grade	1
Department Offered	Architecture	and Civil Engineering			Beggining	M1
	, a office occar o				grade	
Charge teacher	松本 幸大 N	MATSUMOTO Yukihiro)		0	
name[Roman						
alphabet mark]						
Numbering	ARC_MAS54	325				
Objectives of class						
This lecture is concer	ned with the	static continuum med	chanics of elastic	2-dimensional bod	lies. The prima	ry purpose is to
encourage students t	o gain the fu	indamental concept	and to raise th	eir potential abilitie	s for advance	d and practical
applications in the futu	re.					
This lecture is concer	ned with the	static continuum med	chanics of elastic	2-dimensional bod	lies. The prima	ry purpose is to
encourage students t	o gain the fu	undamental concept	and to raise th	eir potential abilitie	es for advance	d and practical
applications in the futu	re.					
Contents of class						
1st – 6th week; Mecha	nics of elastici	ty				
Tensor Analysis in Car	tesian Coordin	ates				
Stresses and Equilibriu	m					
Strain-Displacement R	elations					
Constitutive Equations	in Isotropic El	astic Materials				
7th – 11th week; Mech	anics of elastic	city for composite mat	terial			
Orthotropic material						
Mixturing rule						
Laminate theory						
12th - 15th week; Ela	stic buckling o	of bars and plates				
1st – 6th week; Mecha	nics of elastici	ty				
Tensor Analysis in Car	tesian Coordin	ates				
Stresses and Equilibriu	m					
Strain-Displacement R	elations					
Constitutive Equations	in Isotropic El	astic Materials				
7th – 11th week; Mech	anics of elastic	city for composite mat	terial			
Orthotropic material						
Mixturing rule						
Laminate theory						
12th – 15th week; Ela	stic buckling o	of bars and plates				
Self Preparation and R	eview					
Related subjects						
Notes for touth and						
	ا ۲ ، مازسه ما					
Some handouts will be	distributed.					
Some nandouts will be		The amy of slates			ICDN	079_
rterence i	BOOK TITIE	i neory of plates and	u snells		1901	9/0- 0070950206
	A.#6~~	9 Timesharler	Dublisher	MaGraw-Hill	Dublich	1064
	Author	S. Hmosnenko	rudiisher	Publishing	rudiish	1904
				Company	yoai	
L			1	Sompany	1	

Reference2	Reference2 Book title Theory of Elastic Stability					978- 0486472072		
	Author	S. Timoshenko	Publisher	Dover	Publish	2009		
				Publications	year			
Reference3	Book title	Mechanics of Comp	osite Materials		ISBN	978-		
						0486442396		
	Author	Richard M.	Publisher	Dover	Publish	2005		
		Christensen		Publications	year			
Notes for reference								
Goals to be achieved								
The primary purpose	is to encoura	ige students to gain	the fundamenta	l concept and to r	aise their pote	ntial abilities for		
advanced and practical	l applications i	n the future.						
The primary purpose	is to encoura	ige students to gain	the fundamenta	l concept and to r	aise their pote	ntial abilities for		
advanced and practical	l applications i	n the future.						
Evaluation of achieven	nent							
Based on reports								
Based on reports								
Examination								
レポートで実施								
By Report								
Details of examination								
Other information								
Reference URL								
http://www.st.ace.tut.a	ac.jp/							
http://sel.ace.tut.ac.jp/	/y-matsum/							
http://www.st.ace.tut.a	ac.jp/							
http://sel.ace.tut.ac.jp/	/y-matsum/							
Office hours								
Please contact by ema	uil.							
Please contact by ema	uil.							
Relations to attainmen	t objectives o	f learning and education	on					
Key words	Key words							

(M45630090)Coastal Hydraulics[Coastal Hydraulics]

Subject	Coastal Hydraulics[Coastal Hydraulics]						
Schedule number	M45630090		Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective	
Time of starting a	Fall term		Day of the	Tue.1~1	Credit(s)	2	
Faculty	Graduate Pro	ogram for Master's De	gree		Subject	1~	
Department Offered	Architecture	and Civil Engineering	Beggining grade	M1			
Charge teacher name[Roman alphabet mark]	加藤 茂 KAT	O Shigeru				1	
Numbering	ARC_MAS543	325					
Objectives of class To understand the basic including numerical calc To understand the basic including numerical calc Contents of class Introduction of Coastal water waves, wave the Shore Processes near-shore current, co Coastal Design design process, model Computation of Coastal water waves, wave the Shore Processes near-shore current, co Coastal Design design process, model Computation of Coastal water waves, wave the Shore Processes near-shore current, co	Objectives of class To understand the basic concept of coastal engineering and the advanced knowledge of coastal process, design and protection including numerical calculation. To understand the basic concept of coastal engineering and the advanced knowledge of coastal process, design and protection including numerical calculation. Contents of class • Introduction of Coastal Engineering water waves, wave theories, tides and water levels, wave breaking, etc. • Shore Processes near-shore current, coastal material, beach property, sediment transport, etc. • Computation of Coastal Engineering water waves, model classification, physical & numerical models, etc. • Computation of Coastal Morphology sediment transport rate, analytical computation, numerical solutions, etc. • Introduction of Coastal Engineering water waves, wave theories, tides and water levels, wave breaking, etc. • Computation of Coastal Engineering water waves, wave theories, tides and water levels, wave breaking, etc. • Introduction of Coastal Engineering water waves, wave theories, tides and water levels, wave breaking, etc. • Shore Processes near-shore current, coastal material, beach property, sediment transport, etc. • Shore Processes near-shore current, coastal material, beach property, sediment transport, etc.						
sediment transport rat	e, analytical co	mputation, numerical	solutions, etc.				
Self Preparation and Re Self preparation before references. Self preparation before references.	view e the class an e the class an	d review after the o	class are necess class are necess	sary using the distr sary using the distr	ibuted handout ibuted handout	and/or some and/or some	
Related subjects Basic knowledge of coas Basic knowledge of coas Notes for textbook	stal engineering stal engineering	; is desirable. ; is desirable.					
No textbook is required No textbook is required	No textbook is required for this class. Lecture handout will be distributed. No textbook is required for this class. Lecture handout will be distributed.						
Reference1	Book title	Water Wave Mecha Advanced Series or	nics for Engineer	rs and Scientists - ing - Vol 2	ISBN		
	Author	Robert G. Dean & Robert A Dalrymple	Publisher	World Scientific	Publish year		
Reference2	Book title	Introduction to Coa	astal Engineering	and Management -	ISBN		

		Advanced Series on OceanEngineering - Vol. 16					
	Author	J. William	Publisher	World Scientific	Publish year		
		Kamphuis					
Reference3	Book title	Basic Coastal Engineering			ISBN		
	Author	Robert M	Publisher	Kluwer	Publish year		
		Sorensen		Academic			
				Publishers			
Notes for reference		1		•	1		
Goals to be achieved							
Understanding the cond	cept and metho	dology for coastal e	ngineering.				
Understanding the cond	cept and metho	dology for coastal e	ngineering.				
Evaluation of achievem	ent						
Reports & attendance							
Reports(70%) & attenda	nce(30%)						
Students are required t	o attend essen	tially all classes, and	l to submit all a	ssignments for evaluati	on.		
More than four classes	of absence are	e not allowed for eva	luation.				
Evaluation is based on	total points (ou	it of 100 points) of re	eports (70%) and	d class attendance (30%	b).		
Grade, A: 80 or higher,	B: 65 or higher	to lower than 80, C:	55 or higher to	lower than 65.			
Examination							
レポートで実施							
By Report							
Details of examination							
Other information							
Room : D-812							
E-mail : s-kato@ace.tu	ıt.ac.ip.						
Room : D-812							
E-mail : s-kato@ace.tu	F-mail : s-kato@ace tut ac in						
Reference URL							
N/A							
N/A							
Office hours							
At any time.							
But please ask me the	visit time in ad	vance.					
At any time.							
But please ask me the visit time in advance.							
Relations to attainment objectives of learning and education							
N/A	• • • •						
,							
NI / A							
N/A							
Ney words							
Sediment transport, Cu	rrent, Waves, S	shore protection and	management				
Sediment transport, Current, Waves, Shore protection and management							

(IM45050190)Advanced Structura	a System Planning a	and Design ILAdva	nced Structural Syst	em Planning and D	esign Ij	
Subject name[English]	Advanced Structural System Planning and Design I[Advanced Structural System Plann and Design I]					
Schedule number	M45630190	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective	
Time of starting a course	Fall term	Day of the week.period	Intensive	Credit(s)	2	
Faculty	Graduate Program	n for Master's Deg	ree	Subject grade	1~	
Department Offered	Architecture and	Beggining grade	M1			
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu lin-S					
Numbering	ARC_MAS51025					
It depends on the laboratory. T laboratory supervisor for the spe program of the seminars is annou Contents of class	he resistered stud scial study subjects inced by the superv	dents are required s related to the cu <i>v</i> isor at the guidan	to attend all the s rrent research activi ce of the seminar.	seminars, which is ity of the laborator	arranged by the y. The scheduled	
Self Preparation and Review						
Related subjects						
Notes for textbook						
Notes for reference						
Goals to be achieved						
Evaluation of achievement						
Examination						
レポートで実施						
By Report						
Details of examination						
Other information						
Reference URL						
Office hours						
Relations to attainment objective	s of learning and e	ducation				
Key words						

(M45630210)Advanced Environm	ental System Plann	ning and I	Desig	n I[Ad	vanced Environmen	tal System Plannin	g and Design I]
Subject name[English]	Advanced Environmental System Planning and Design I[Advanced Environmental System Planning and Design I]					onmental System	
Schedule number	M45630210	Subjec	t are	a	Advanced	Required or	Elective
					Architecture	elective	
					and Civil		
					Engineering		
Time of starting a course	Fall term	Day week.p	of period	the	Intensive	Credit(s)	2
Faculty	Graduate Prograr	n for Mas	ster's	Degre	e	Subject grade	1~
Department Offered	Architecture and	Civil Eng	gineer	ing		Beggining	M1
Charge teacher name[Roman	S5系教務委員 5	kei kyom	u Iin-	·S		Biddo	
Alphabet markj	ARC MAS51025						
	AI(0_WIA331023						
It depends on the laboratory. I	he resistered stud	dents are	e requ	uired	to attend all the s	seminars, which is	arranged by the
laboratory supervisor for the spe	scial study subjects	s related	to th	ie curi	rent research activi	ty of the laborator	y. The scheduled
program of the seminars is annou	inced by the superv	visor at ti	he gu	Idance	e 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							
レポートで実施							
By Report							
Details of examination							
Other information							
Reference URL							
Office hours							
Relations to attainment objectives of learning and education							
Key words							

(M45630230)Advanced Regional System Planning and Design I[Advanced Regional System Planning and Design I]

Subject name[English]	Advanced Regio	nal System Planning	and Design I Adva	aced Regional Svs	tem Planning and	
	Design I					
Schedule number	M45630230	Subject area	Advanced	Required or	Flective	
	10143030230	Subject area	Architactura	cleating	LIECTIVE	
			Architecture	01001140		
			En aline e ulina			
Time of starting a second	E all tarma	Dave of the	Engineering	Out dit(a)	0	
lime of starting a course	Fall term	Day of the	Intensive	Gredit(s)	2	
		week,period				
Faculty	Graduate Progra	am for Master's Degre	ee	Subject grade	1~	
Department Offered	Architecture an	d Civil Engineering		Beggining	M1	
				grade		
Charge teacher name[Roman	S5系教務委員	5kei kyomu Iin-S				
alphabet mark]						
Numbering	ARC_MAS51025	5				
Objectives of class						
It depends on the laboratory. T	he resistered stu	udents are required	to attend all the s	eminars, which is	arranged by the	
laboratory supervisor for the spe	cial study subject	ts related to the cur	rent research activi	ty of the laborator	v The scheduled	
program of the seminars is appoint	inced by the sune	rvisor at the guidance	of the seminar		y. The concurrence	
Contents of class	nocu by the supe					
Self Preparation and Review						
Related subjects						
Notes for textbook						
Notes for reference						
Goals to be achieved						
Evaluation of achievement						
P 1 11						
レホートで実施						
By Report						
Details of examination						
Other information						
Reference URL						
Office hours						
Delations to attainment abjections of learning and advection						
Relations to attainment objectives of learning and education						
1						
Key words						
-						

(M45630290)Seismic Design of Structures[Seismic Design of Structures]

Subject name[English]	Seismic Design of	f Structure	Seismi	Design of Structur	es]		
Schedule number	M45630290	Subject a	rea	Advanced	Required or	Elective	
		011,0000	liou	Architecture	elective		
				and Civil	0.000.00		
				Engineering			
Time of starting a course	Fall term	Dav of	the	Wed.3~3	Credit(s)	2	
-		week,per	iod				
Faculty	Graduate Program	n for Maste	r's Degr	e	Subject grade	1~	
Department Offered	Architecture and	Civil Engine	ering		Beggining	M1	
					grade		
Charge teacher name[Roman	齊藤 大樹 SAITO	OH Taiki					
alphabet mark]							
Numbering	ARC_MAS51025						
Objectives of class							
The objective of this class is to	o learn the evaluat	tion metho	d of stru	ictural performance	of the building ba	ased on dynamic	
behavior and ultimate strength ar	nd deformation capa	acity.					
The objective of this class is to	o learn the evaluat	tion metho	d of stru	ictural performance	of the building ba	ased on dynamic	
behavior and ultimate strength ar	nd deformation capa	acity.					
Contents of class							
1. Basic concept of seismic desig	n of building						
2. Force-deformation characteris	tics of building mat	erials					
3. Seismic evaluation method for	existing buildings						
3-1. Screening method 1							
3-2. Screening method 2							
4. Post-seismic quick risk assess	ment of damaged b	ouilding					
1. Basic concept of seismic desig	n of building						
2. Force-deformation characteris	tics of building mat	erials					
3. Seismic evaluation method for	existing buildings						
3-1. Screening method 1							
3-2. Screening method 2							
4. Post-seismic quick risk assess	ment of damaged b	ouilding					
Self Preparation and Review							
Related subjects							
None							
None							
Notes for textbook							
Notes for reference							
To understand structured designs	brough looming the	o colomia -	aluation	method of atructure	al member and built	ding	
To understand structural design through learning the seismic evaluation method of structural member and building.							
To understand structural design through learning the seismic evaluation method of structural member and building.							
Evaluation of achievement							
Report							
Report							
レハート C 天心 By Report							
By Report							
Others information							
		. (5					
Protessor Taiki Saito (D805), e-mail: tsaito@ace.tut.ac.jp (Room: D-805)							
Protessor I alki Saito (U805), e-mail: tsaito@ace.tut.ac.jp (Room: D-805)							
Reference URL							

http://www.rc.ace.tut.ac.jp/saito/index-e.html http://www.rc.ace.tut.ac.jp/saito/index-e.html **Office hours** Please contact by e-mail to make an appointment. Please contact by e-mail to make an appointment.

Relations to attainment objectives of learning and education

Key words