Syllabus

International Master's Degree Program (2019-Fall Term)

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

	Culture and Comr	munication II[Culture	and Communicati	on II]	
Schedule number	M40030040	Subject area	General	Required or	Elective
			courses	elective	
Time of starting a course	Fall term	Day of the	Thu.1~1	Credit(s)	2
Faculty	Graduata Dua mu	week,period n for Master's Degre	0	Subject mode	1~
Department Offered	5	ineering, Architect		Subject grade Beggining grade	1~⊂ M1
	0	ctrical and Electro		Dogginnig grade	
	Engineering, Cor				
		v and Life Science	nu Engineering,		
Charge teacher name[Roman	吉川 りさ YOSHI				
alphabet mark]					
Numbering	GEN_LIB51025				
Objectives of class					
The primary purposes of this class	are:				
(1) To encourage the students to l		ulturalism and interre	lated issues relate	d to SDGc	
(1) To raise the student's awarene				d to obus.	
		a other cultures.			
(3) To prepare the students for glo Contents of class	soar orazonsnip.				
Week 1 Introduction					
Week 1 Introduction Week 2 Theme 1 (Grouping and To	nic Assignment)				
Week 2 Theme 1 (Grouping and To Week 3 Theme 1 (Group discussio					
Week 3 Theme 1 (Group discussion Week 4 Theme 1 (Presentation and					
Week 5 Theme 2 (Grouping and To					
Week 6 Theme 2 (Grouping and 10 Week 6 Theme 2 (Group discussion	-				
Week 7 Theme 2 (Group discussion Week 7 Theme 2 (Presentation and					
Week 7 Theme 2 (Presentation and Week 8 Wrap-up	u Discussio(1)				
Week 8 Wrap-up Week 9 Theme 3 (Grouping and To	nic Assignment)				
Week 10 Theme 3 (Group discussion					
Week 11 Theme 3 (Presentation a					
Week 12 Theme 4 (Grouping and T					
Week 12 Theme 4 (Group discussion of the second sec	-				
Week 14 Theme 4 (Presentation a					
Week 15 Review					
Self Preparation and Review					
•	materials for each	class where approp	riate Read them a	nd prepare for the	class
The instructor will provide reading					
The instructor will provide reading	materials for each	class where approp			01400.
The instructor will provide reading	materials for each	class where approp			
The instructor will provide reading	materials for each	class where approp			
The instructor will provide reading Related subjects	materials for each	class where approp			
The instructor will provide reading Related subjects Notes for textbook					
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The instructor will provide reading Related subjects Notes for textbook No textbook is required for this co No textbook is required for this co Notes for reference Goals to be achieved 1. To understand the relationships 2. To develop synthesizing, analyzi	ourse. All materials ourse. All materials among people, cult	will be provided. will be provided. tures, and society.		e global issues.	
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The instructor will provide reading Related subjects Notes for textbook No textbook is required for this co No textbook is required for this co Notes for reference Goals to be achieved 1. To understand the relationships 2. To develop synthesizing, analyzi Evaluation of achievement In-class work (group presentation Final grades will be given on an ab 90% or above: S 80% or above: A 70% or above: B	ourse. All materials burse. All materials among people, cult ing, and applying cu	will be provided. will be provided. tures, and society. mulative knowledge	and skills to tackle		
The instructor will provide reading Related subjects Notes for textbook No textbook is required for this co No textbook is required for this co Notes for reference Goals to be achieved 1. To understand the relationships 2. To develop synthesizing, analyzi Evaluation of achievement In-class work (group presentation Final grades will be given on an ab 90% or above: S 80% or above: A 70% or above: B 60% or above: C	ourse. All materials burse. All materials among people, cult ing, and applying cu	will be provided. will be provided. tures, and society. mulative knowledge	and skills to tackle		
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The instructor will provide reading Related subjects Notes for textbook No textbook is required for this co No textbook is required for this co Notes for reference Goals to be achieved 1. To understand the relationships 2. To develop synthesizing, analyzi Evaluation of achievement In-class work (group presentation Final grades will be given on an ab 90% or above: S 80% or above: A 70% or above: B 60% or above: C	ourse. All materials burse. All materials among people, cult ing, and applying cu	will be provided. will be provided. tures, and society. mulative knowledge	and skills to tackle		

Other information

Office: B-509 E-mail: yosikawa@las.tut.ac.jp

Reference URL

Office hours

Please contact the teacher by email to arrange a meeting time. Relations to attainment objectives of learning and education

(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るグローバルな感性を持ち、人間と自然との共生、公共の福祉について考える能力を身につけている。
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(A) Personality and outlook with a broad perspective Have an international mindset to see human society from various angles with a global perspective; and the ability to consider the symbiosis between humans and nature as well as publicwelfare (A) Personality and outlook with a broad perspective Have an international mindset to see human society from various angles with a global perspective; the ability to consider the symbiosis between humans and nature as well as publicwelfare (A) Personality and outlook with a broad perspective Have an international mindset to see human society from various angles with a global perspective; and the ability to consider the symbiosis between humans and nature as well as publicwelfare (A) Personality and outlook with a broad perspective Have a mindset to see human society from various angles with a global perspective; and the ability to consider the symbiosis between humans and nature as well as public welfare (A) Personality and outlook with a broad perspective Have an international mindset to see human society from various angles with a global perspective; and the ability to consider the symbiosis between humans and nature as well as publicwelfare Key words

Subject name[English]	Principles of Japanese Gram	mar[Principles of Ja	panese Grammar]		
Schedule number	M40030090	Subject area	General courses	Required or elective	Elective
Time of starting a	Fall term	Day of the	Thu.1~1	Credit(s)	2
course Faculty	Graduate Program for Master	's Degree		Subject	1~
Department Offered	Mechanical Engineering, A			grade Beggining	M1
	Electrical and Electronic Science and Engineering, App	lied Chemistry and		grade	
Charge teacher name[Roman alphabet	吉村 弓子 YOSHIMURA Yun	niko			
mark]					
Numbering	GEN_LIB54025				
Objectives of class					
This course aims to provid	de an opportunity to understan	d an overview of ele	ementary Japanese g	rammar for the	very beginners
In order to concentrate o	on grammar, students will not	learn Japanese lett	ers and conversation	n. The course w	ill be taught ir
English, and progress rapid	dly.				
Contents of class	a the environ and several feat.	was of language			
UT (TU/TU) Introduction to	o the course and general featu	res of Japanese			
02 (10/17) Pronunciation	, Lesson 1: Copula, Particle ″w	va″ [topic], and Dec	larative, negative, and	d interrogative s	entence
03 (10/24) Lesson 2 and	3: Demonstratives and Particle	e "no" [possession]			
	nd 5: Verbs, Tense (non-pas tation], and "to" [cooperation]		le ″ni″ [time], ″kar	a [start], "mad	e″ [goal], ″e′
05 (11/07) Lesson 6 and	7; Particle ″o″ [object], ″de″	[place][means], ″ni″	[goal][source]		
06 (11/14) Lesson 8: Adje	ectives, Lesson 9: Particle ″ga	"[object]			
07 (11/21) Lesson 10: Ex	istence, Lesson 11: Numerals	and Counter suffixe	s		
08 (11/28)Lesson 12: Pa	ist tense of adjectives, Lesson	13: Adjectives of D	esire		
09 (12/05) Lesson 14 and	d 15: Verb groups, "te"-form c	of verbs, and Senten	ces using "te"-form		
10 (12/12) Lesson 16: Se	entences using "te"-form, Less	son 17: ″nai″-form o	of verbs		
11 (01/09) Lesson 18: Die	ctionary form of verbs, Lesson	19: "ta"-form of ve	erbs		
12 (01/16) Lesson 20: Po	lite and plain style, Lesson 21	Indirect speech			
13 (01/23) Lesson 22: No	oun modification				
14 (01/30) Lesson 23: Co	omplex sentence using "toki"[v	when], Lesson 25: C	onditional mood		
15 (02/13) Lesson 24: Ex	changing things or kindness				
16 (02/27) Final exam					
Solf Droparation and David	A 147				
Self Preparation and Revie Read the respective parts	ew of the textbook in advance.				

Related subjects "Basic Grammar 1" of non-credit course "Basic Japanese" will cover Exercise A and B of the main textbook.

	ok1 Book title Minna no Nihongo (Elementary Japanese I, 2nd Edition) Translation & Grammar Notes-English Romanized Version				ISBN	978-4- 88319-629-6
	Author		Publisher	3A Corporation	Publish year	2013
Notes for textbook Each lesson consists 1)Vocabulary and 4)gr				3)useful words and info	ormation, and 4)	grammar notes
Notes for reference						
Goals to be achieved						
At the end of this cou		oe able				
1) to know pronunciat	tion of Japanese la	inguage.				
 to understand pror to grasp an overvie 			Japanese voca	abulary.		
Evaluation of achieve						
Grading Policy: Quizz	es 30%, Final exam	/0%				
Evaluation Criteria: S obtained from what sl		required attendan	ce will be evalu	ated as follows by the	total points (out	t of 100 points)
S: 90 or higher						
A: between 80 and 89)					
B: between 70 and 79)					
C: between 60 and 69)					
Examination 定期試験を実施(対配	<u>ត</u>)					
定期試験を実施(対面 Examination(Face to	Face)					
定期試験を実施(対面 Examination(Face to Details of examination	Face)					
定期試験を実施(対置 Examination(Face to Details of examinatio N/A	Face)					
定期試験を実施(対産 Examination(Face to Details of examination N/A Other information	Face) n	un norma) of Duincia		- Crammar ^{rrr} at the cub		
定期試験を実施(対産 Examination(Face to Details of examination N/A Other information When you contact by	Face) n	ur name) of Princip	les of Japanes	e Grammar″ at the subj	ect.	
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定期試験を実施(対距 Examination(Face to Details of examination N/A Other information When you contact by Reference URL N/A Office hours Office Hour Friday 11:00-12:00	Face) n e-mail, write ″(you			e Grammar″ at the subj	ect.	
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定期試験を実施(対正 Examination(Face to) Details of examination N/A Other information When you contact by Reference URL N/A Office hours Office Hour Friday 11:00-12:00 By appointment 08:30	Face) n e-mail, write ″(you 0–12:00, 13:30–16:3	10 on weekday will	be available.	e Grammar″ at the subj	ect.	
定期試験を実施(対理 Examination(Face to Details of examination N/A Other information When you contact by Reference URL N/A Office hours Office Hour Friday 11:00-12:00 By appointment 08:30 Relations to attainme 機械工学専攻 (A)幅広い人間性と考	Face) n e-mail, write "(you)-12:00, 13:30-16:3 ont objectives of le 答え方	30 on weekday will P arning and educati	be available. on	e Grammar [‴] at the subj		
定期試験を実施(対理 Examination(Face to Details of examination N/A Other information When you contact by Reference URL N/A Office hours Office Hour Friday 11:00-12:00 By appointment 08:30 Relations to attainme 機械工学専攻 (A)幅広い人間性と考 人間社会を地球的な 力を身につけている。	Face) n e-mail, write ⁽ (you)-12:00, 13:30-16:3 int objectives of le 時え方 視点から多面的に	30 on weekday will Parming and educati とらえるグローバル	be available. on レな感性を持ち		公共の福祉につ	

ンする能力を身につけている。 電気·電子情報工学専攻 (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るグローバルな感性を持ち、人間と自然との共生、公共の福祉について考える能 力を身につけている。 (D1) 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・発信し, コミュニケーショ ンする能力を身につけている。 情報·知能工学真攻 (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るグローバルな感性を持ち、人間と自然との共生、公共の福祉について考える能 カを身につけている。 (D1) 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・発信し, コミュニケーショ ンする能力を身につけている。 応用化学·生命工学専攻 (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るグローバルな感性を持ち、人間と自然との共生、公共の福祉について考える能 力を身につけている。 (D1) 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・発信し、コミュニケーショ ンする能力を身につけている。 建築・都市システム学専攻 (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るグローバルな感性を持ち、人間と自然との共生、公共の福祉について考える能 力を身につけている。 (D1) 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・発信し, コミュニケーショ ンする能力を身につけている。 Graduate Program of Mechanical Engineering for Master's Degree

(A) Personality and outlook with a broad perspective Have an international mindset to see human society from various angles with a global perspective; and the ability to consider the symbiosis between humans and nature as well as publicwelfare (D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media Graduate Program of Electrical and Electronic Information Engineering for Master's Degree (A) Personality and outlook with a broad perspective Have an international mindset to see human society from various angles with a global perspective; the ability to consider the symbiosis between humans and nature as well as publicwelfare (D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media Graduate Program of Computer Science and Engineering for Master's Degree (A) Personality and outlook with a broad perspective Have an international mindset to see human society from various angles with a global perspective; and the ability to consider the symbiosis between humans and nature as well as publicwelfare (D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media Graduate Program of Applied Chemistry and Life Science for Master's Degree (A) Personality and outlook with a broad perspective Have a mindset to see human society from various angles with a global perspective; and the ability to consider the symbiosis between humans and nature as well as public welfare (D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media Graduate Program of Architecture and Civil Engineering for Master's Degree (A) Personality and outlook with a broad perspective Have an international mindset to see human society from various angles with a global perspective; and the ability to consider the symbiosis between humans and nature as well as publicwelfare (D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media Key words elementary Japanese, grammar

(M40030100)Japanese Industrial Technologies and Innovations[Japanese Industrial Technologies and Innovations]

Subject name[English]	Japanese Industr Innovations]	ial Technologies a	nd Innovations[Jap	anese Industrial ٦	Fechnologies and	
Schedule number	M40030100	Subject area	General courses	Required or elective	Elective	
Time of starting a course	Fall term	Day of the week,period	Intensive	Credit(s)	2	
Faculty	Graduate Program for Master's Degree Subject grade 1~					
Department Offered	Mechanical Eng	ineering, Architec	ture and Civil	Beggining	M1	
	Engineering, Elec	ctrical and Electr	grade			
	Engineering, Cor					
	Applied Chemistry and Life Science					
Charge teacher name[Roman	青野 雅樹,大和 真樹,齊藤 大樹,井上 光輝,谷口 恭弘,入山 恭彦,高野 靖,角田					
alphabet mark]	正也,松本 雅行	,小林 真一,石田	好輝 AONO Ma	saki, OHWA Masal	ki, SAITOH Taiki,	
	INOUE Mitsuteru,	, TANIGUCHI Yasu	hiro, IRIYAMA Tak	ahiko, TAKANO Y	′asushi, KAKUTA	
	Masaya, MATSUN	IOTO Masayuki, KO	BAYASHI Shinichi,	ISHIDA Yoshiteru		
Numbering	COM_MAS51025					

Objectives of class

In this series of lectures, the excellent experts of our university and Japanese leading companies from variety of fields in engineering impart to the engineering students knowledge of superior industry technologies in Japan. Students learn advantages and its contributing factors of Japanese industrial technologies.

* International students dispatched by JICA Development Studies Program (JICA-DSP) including ABE, Innovative Asia and PEACE in 2019 should take this subject as a compulsory course.

Contents of class

Each experts deliver lecture on specific industrial technology and its advantage from his reserch field. Some reserchers show difficulties and contributing factors of developing technologies through behind-the-scenes story. Some experts from manufacturing company show signature process how transform "technologies" to "industory or production" in Japanese companies.

- 1. Masaki Aono
- 2. Masaki Owa
- 3~5. Taiki Saito
- 6. Mitsuteru Inoue
- 7. Masaki Owa
- 8. Yasuhiro Taniguchi
- 9. Yasuhiko Iriyama
- 10. Yasushi Takano
- 11. Masaya Kakuta
- 12. Masayuki Matsumoto
- 13. Masaki Owa
- 14. Shinichi Kobayashi 15. Yoshiteru Ishida

Self Preparation and Review

Related subjects

Notes for textbook

Notes for reference

Goals to be achieved

1) To understand Japanese superior industrial technologies.

2) To concider contributing factors of creativity of industrial technologies in Japan showing specific technologies covered by lectures.

3) To analize advantages of application of science and technology on production process in Japanese manufacturing companies.

Evaluation of achievement

Evaluation method scoring will be processed by sum of each report evaluation

Evaluation criteria:	
Students who attend a	all classes will be evaluated as follows:
S: Achieved all goals a	and obtained total points of exanm and reports, 90 or high (out of 100 points)
A: Achieved all goals a	and obtained total points of exanm and reports, 80 or high (out of 100 points)
B: Achieved at least 6	5% of goals and obtained total points of exanm and reports, 70 or high (out of 100 points)
C: Achieved at least 5	55% of goals and obtained total points of exanm and reports, 60 or high (out of 100 points)
Examination	
レポートで実施	
By Report	
Details of examination	n
None during exam per	iod
Other information	
Reference URL	
After each class	
	nt objectives of learning and education
(A)幅広い人間性と考	\$え方
	視点から多面的にとらえるグローバルな感性を持ち、人間と自然との共生、公共の福祉について考える
力を身につけている。	
(A) Personality and ou	utlook with a broad perspective
Have an international	mindset to see human society from various angles with a global perspective; the ability to consider the
symbiosis between hu	mans and nature as well as publicwelfare
Key words	

industrial technology, develoment technology, application technology

(M40110020)Ethics for Researchers[Ethics for Researchers]

Ethics for Researchers[Ethics for Researchers]					
M40110020 Subject area		General	Required or	Required	
		courses	elective		
Fall1 term	Day of the	Wed.1~1	Credit(s)	1	
	week,period				
Graduate Program	n for Master's Degre	Subject grade	1~		
Mechanical Engi	ineering, Architec [.]	ture and Civil	Beggining	M1	
Engineering, Elec	ctrical and Electro	onic Information	grade		
Engineering, Computer Science and Engineering,					
Applied Chemistry	/ and Life Science				
教務委員会副委員	員長,田中 三郎 kyo	oumu iinkai fukuiint	you, TANAKA Sabu	iro	
COM_MAS51015					
	M40110020 Fall1 term Graduate Program Mechanical Eng Engineering, Elec Engineering, Cor Applied Chemistry 教務委員会副委員	M40110020 Subject area Fall1 term Day of the week,period Graduate Program for Master's Degree Mechanical Engineering, Architect Engineering, Electrical and Electric Engineering, Computer Science at Applied Chemistry and Life Science 教務委員会副委員長,田中 三郎 kyo	M40110020 Subject area General courses Fall1 term Day of the week,period Wed.1~1 Graduate Program for Master's Degree Mechanical Engineering, Architecture and Civil Engineering, Electrical and Electronic Information Engineering, Computer Science and Engineering, Applied Chemistry and Life Science Master's Degree	M40110020 Subject area General courses Required or elective Fall1 term Day of the week,period Wed.1~1 Credit(s) Graduate Program for Master's Degree Subject grade Mechanical Engineering, Architecture and Civil Engineering, Electrical and Electronic Information Engineering, Computer Science and Engineering, Applied Chemistry and Life Science Beggining grade 教務委員会副委員長,田中 三郎 kyoumu iinkai fukuiintyou, TANAKA Sabu	

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(2019.10.9): Introduction, 1st module("Research Misconduct") in e-learning

* 2nd - 6th week(October 16 - November 20): 2nd - 6th 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"

Submit the e-learning Certificate to the Education Division.

* ~7th week(November 20 - November 26): Discussion with supervisor

* 8th week(Dcember 4 2019) : 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 report(100%)

[Evaluation basis]

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

- S: Obtained total points of reports, 90 or higher (out of 100 points).
- A: Obtained total points of reports, 80 or higher (out of 100 points).
- B: Obtained total points of reports, 70 or higher (out of 100 points).
- C: Obtained total points of reports, 60 or higher (out of 100 points).

Examination

レポートで実施

Details of	examination
By report	
Other info	mation
N/A	
Reference	URL
N/A	
Office hou	rs
Before/aft	er the class
Relations 1	to attainment objectives of learning and education
	*・研究者としての正しい倫理観と社会性
	者・研究者として社会的・倫理的責任を有し,社会における技術的課題を設定・解決・評価する能力を身につけてし
る。	
	へ人間性と考え方 たりまたもの トレン タブ かいしいこう パック ボックボ りょうかん 一般したがし タリリー クリックボール・マンマネ うろん
	を地球的な視点から多面的にとらえるグローバルな感性を持ち、人間と自然との共生、公共の福祉について考える前 Dけている。
	がている。 ぎ・研究者としての正しい倫理観と社会性
	a・研究者としての正しい無理観と社会性 者・研究者として社会的・倫理的責任を有し、社会における技術的課題を設定・解決・評価する能力を身につけてし
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	≝・研究者としての正しい倫理観と社会性
	者・研究者として社会的・倫理的責任を有し、社会における技術的課題を設定・解決・評価する能力を身につけてし
工 (の)へ们 る。	
	ホ・研究者としての正しい倫理観と社会性
	* 研究者として社会的・倫理的責任を有し、社会における技術的課題を設定・解決・評価する能力を身につけてし
る。	
(B)技術者	ă・研究者としての正しい倫理観と社会性
上級技術	者・研究者として社会的・倫理的責任を有し、社会における技術的課題を設定・解決・評価する能力を身につけてし
る。	
(B) Sound	ethics and social awareness as advanced-level engineers and researchers
	ous of specialized and ethical responsibilities as advanced-level engineers and researchers; and have the ability t
	and evaluatetechnical issues in society
	ality and outlook with a broad perspective
symbiosis	ternational mindset to see human society from various angles with a global perspective; the ability to consider the between humans and nature as well as publicwelfare
	ethics and social awareness as advanced-level engineers and researchers
	ous of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set
	evaluate technicalissues in society
	ethics and social awareness as advanced-level engineers and researchers
	bus of specialized and ethical responsibilities as advanced-level engineers and researchers; and have the ability tr and evaluate technical insues in society.
	and evaluatetechnical issues in society ethics and social awareness as advanced-level engineers and researchers
	ous of specialized and ethical responsibilities as advanced-level engineers and researchers; and have the ability to
	and evaluatetechnical issues in society
	ethics and social awareness as advanced-level engineers and researchers
	bus of specialized and ethical responsibilities as advanced-level engineers and researchers; and have the ability to
	and evaluate technical issues in society
Key words	
	Ethics, Conflict of Interest, Legal Compliance, Research Misconduct, Confidentiality Obligation, Security Expor

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

Subject name[English]	Seminar on Mec	nanical Engineering I			
Schedule number	M41610010	Subject area	Advanced	Required or	Required
			Mechanical	elective	
			Engineering		
Time of starting a course	Year	Day of the	Intensive	Credit(s)	4
F a and h a a	Que de la D	week,period		0.4/	1
Faculty		am for Master's Degre	e	Subject grade	1~
Department Offered	Mechanical Engi	neering		Beggining	M1
Charge teacher name[Roman	01 玄劫 称 禾 吕	1kei kyomu Iin-S		grade	
alphabet mark]	31 宋秋彻女員				
Numbering	MEC MAS51015	i			
Objectives of class	<u> </u>	•			
The seminar aims to provide a bro	ad understanding	of the mechanical e	ngineering availah	e for the master the	esis research of
student.					
The seminar aims to provide a bro	ad understandin	of the mechanical e	ngineering availab	le for the master the	esis research of
student.					
Contents of class					
The class provides both of fundar	mental knowledge	e of his/her master t	hesis research wo	ork and the most ad	vanced results i
the related field by reading resea	-				
announced by individual supervisor					
The class provides both of fundar		e of his/her master t	hesis research wo	ork and the most ad	vanced results i
the related field by reading resea	-				
announced by individual supervisor				-	
Self Preparation and Review					
Different in each laboratory					
Different in each laboratory					
Related subjects					
Different in each laboratory					
Different in each laboratory					
Notes for textbook					
Different in each laboratory					
Different in each laboratory					
Notes for reference					
N/A					
N/A					
Goals to be achieved					
To acquire fundamental knowledge	e of individual res	earch fields.			
To acquire the ability to find probl	ems, the ability t	o solve the problems,	and the presenta	tion skill.	
To acquire fundamental knowledge					
To acquire the ability to find probl	ems, the ability t	o solve the problems,	and the presenta	tion skill.	
Evaluation of achievement					
Holding meetings to report tasks f	or each laborato	ry and comprehensive	ly evaluating the i	results including con	tents,
materials and attitudes.					tents,
materials and attitudes. Grade levels are C(60% - less thar	n 70%), B(70– less	s than 80%), A(80% - I	ess than 90 %) and	d S(90% or over).	
Holding meetings to report tasks f materials and attitudes. Grade levels are C(60% - less thar Holding meetings to report tasks f	n 70%), B(70– less	s than 80%), A(80% - I	ess than 90 %) and	d S(90% or over).	
materials and attitudes. Grade levels are C(60% - less thar Holding meetings to report tasks f materials and attitudes.	n 70%), B(70- less or each laboratoi	s than 80%), A(80% – I ry and comprehensive	ess than 90 %) and Iy evaluating the r	d S(90% or over). results including con	
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materials and attitudes. Grade levels are C(60% - less thar Holding meetings to report tasks f materials and attitudes. Grade levels are C(60% - less thar Examination	n 70%), B(70- less or each laboratoi	s than 80%), A(80% – I ry and comprehensive	ess than 90 %) and Iy evaluating the r	d S(90% or over). results including con	
materials and attitudes. Grade levels are C(60% - less thar Holding meetings to report tasks f materials and attitudes. Grade levels are C(60% - less thar Examination 試験期間中には何も行わない	n 70%), B(70- less or each laboratoi	s than 80%), A(80% – I ry and comprehensive	ess than 90 %) and Iy evaluating the r	d S(90% or over). results including con	
materials and attitudes. Grade levels are C(60% - less thar Holding meetings to report tasks f materials and attitudes. Grade levels are C(60% - less thar Examination 試験期間中には何も行わない None during exam period	n 70%), B(70- less or each laboratoi	s than 80%), A(80% – I ry and comprehensive	ess than 90 %) and Iy evaluating the r	d S(90% or over). results including con	
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materials and attitudes. Grade levels are C(60% - less thar Holding meetings to report tasks f materials and attitudes. Grade levels are C(60% - less thar Examination 試験期間中には何も行わない None during exam period Details of examination N/A	n 70%), B(70- less or each laboratoi	s than 80%), A(80% – I ry and comprehensive	ess than 90 %) and Iy evaluating the r	d S(90% or over). results including con	
materials and attitudes. Grade levels are C(60% - less thar Holding meetings to report tasks f materials and attitudes. Grade levels are C(60% - less thar Examination 試験期間中には何も行わない None during exam period Details of examination N/A N/A	n 70%), B(70- less or each laboratoi	s than 80%), A(80% – I ry and comprehensive	ess than 90 %) and Iy evaluating the r	d S(90% or over). results including con	
materials and attitudes. Grade levels are C(60% - less thar Holding meetings to report tasks f materials and attitudes. Grade levels are C(60% - less thar Examination 試験期間中には何も行わない None during exam period Details of examination N/A N/A Other information	n 70%), B(70- less or each laboratoi	s than 80%), A(80% – I ry and comprehensive	ess than 90 %) and Iy evaluating the r	d S(90% or over). results including con	
materials and attitudes. Grade levels are C(60% - less thar Holding meetings to report tasks f materials and attitudes. Grade levels are C(60% - less thar Examination 試験期間中には何も行わない None during exam period Details of examination N/A	n 70%), B(70- less or each laboratoi	s than 80%), A(80% – I ry and comprehensive	ess than 90 %) and Iy evaluating the r	d S(90% or over). results including con	

Different in each laboratory Different in each laboratory

Office hours

Different in each laboratory

Different in each laboratory

Relations to attainment objectives of learning and education

(C)高度な知識を統合的に活用できる実践力・創造力

機械工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。

(C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。 (C2)機械工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得して、研究開発の計画を立 案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。

(D)グローバルに活躍できるコミュニケーションカ

グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で、自らの考えや成果を効果的に表現するコミュニケーションカを身につけている。

(D1)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・発信し, コミュニケーションする能力を身につけている。

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge forproblem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineering and related fields; and to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about mechanical engineering and related fields; to make plans for research and development and put them intopractice; and to create new technologies to solve problems

(D) Communication skills for global success

Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members

(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

Key words

Mechanical engineering, Mechanical system design, Materials and manufacturing, System control and robotics, Environment and energy

Mechanical engineering, Mechanical system design, Materials and manufacturing, System control and robotics, Environment and energy

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

Schedule number	Seminar on weer	nanical Engineering I	[Seminar on Mecha	anical Engineering II]	
	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 Degr	e	Subject grade	2~
Department Offered	Mechanical Engir	neering		Beggining	M2
				grade	
Charge teacher name[Roman	S1系教務委員1	lkei 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
student.					
The seminar aims to provide a br	oad understanding	of the mechanical e	ngineering available	e for the master the	sis research of
student.					
Contents of class					
The class provides both of funda					
the related field by reading rese		monographs. The co	ontents of the clas	ss depend on the s	upervisor. To be
announced by individual supervise	ors.				
The class provides both of funda	-				
the related field by reading rese		monographs. The co	ontents of the clas	ss depend on the s	upervisor. To b
announced by individual supervise	ors.				
Self Preparation and Review					
Given by supervisors.					
Given by supervisors.					
Related subjects					
N/A					
N/A					
Notes for textbook					
Given by supervisors.					
Given by supervisors.					
Notes for reference					
N/A					
N/A N/A					
N/A	e of individual rese	earch fields.			
N/A Goals to be achieved			and the presentat	ion skill.	
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N/A Goals to be achieved To acquire fundamental knowledg To acquire fundamental knowledg To acquire fundamental knowledg To acquire fundamental knowledg To acquire the ability to find prob Evaluation of achievement Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co None during evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Evaluated comprehensively by co Grade levels are C(60% - less tha Eva	olems, the ability to ge of individual rese olems, the ability to intent, reports, con in 70%), B(70% - les intent, reports, con in 70%), B(70% - les supervisor.	o solve the problems earch fields. o solve the problems usiderations, etc. of p ss than 80%), A(80% - isiderations, etc. of p	and the presentat presentation in eac - less than 90%) an presentation in eac	ion skill. h laboratory. d S(90% or over). h laboratory.	

Reference URL	
N/A	
N/A	
Office hours	
Contact your supervisor.	
Contact your supervisor.	
Relations to attainment objectives of learning and education	
(C)高度な知識を統合的に活用できる実践力・創造力 機械工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活 力を身につけている。 (C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる	
(C2)機械工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得し 案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。 (D)グローバルに活躍できるコミュニケーションカ	
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で,自らの考えや成果を ケーションカを身につけている。	効果的に表現するコミュニ
(D1)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 ンする能力を身につけている。	見・発信し, コミュニケーショ
(D2)チーム内の個々の要員の価値観を互いに尊重するとともに、協調して、チームとしての目標達成1 につけている。	こ寄与できる高い能力を身
(E)最新の技術や社会環境の変化に対する探究心と持続的学習力 社会,環境,技術等の変化に対応して,生涯にわたって自発的に計画し学習する能力を身につけてい	る。
 (C) Practical and creative skills to utilize advanced knowledge in an integrated manner Have advanced knowledge about mechanical engineering and related fields and have the practical and such knowledge forproblem solving in an integrated manner (C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineer to utilize such knowledge in an integrated manner (C2) Have the skills to always a superior methodologie for research and doublegement they 	ring and related fields; and
(C2) Have the skills to learn, by experience, methodologies for research and development throw knowledge about mechanical engineering and related fields; to make plans for research and de intopractice; and to create new technologies to solve problems (D) Communication skills for global success	
Have the communication skills to effectively express one's own ideas and results while working on changing society in cooperation with other team members	issues faced by a globally
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in que through papers, oral reports or information media	
(D2) Have high skills to mutually respect the values of individual team members; and to contribute to through working cooperatively with other team members	
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology environment	and changes in the social
Have the skills to voluntarily make plans and learn throughout one's life in response to changesin technology	society, environment and
Key words	
Mechanical engineering, Mechanical system design, Materials and manufacturing, System control and	robotics, Environment and
energy	
Mechanical engineering, Mechanical system design, Materials and manufacturing, System control and	robotics, Environment and

(M41610030)Thesis Research on Mechanical Engineering[Thesis	Research on Mechanical Engineering]
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Subject name[English]	Thesis Research	on Mechan	ical Engi	neering[Thesis Re	esearch on Mechanic	al Engineering]	
Schedule number	M41610030 Subject area		Advanced	Required or	Required		
				Mechanical	elective		
				Engineering			
Time of starting a course	2Years	Day of week,per		Intensive	Credit(s)	6	
Faculty	Graduate Progran	n for Maste	r's Degr	e	Subject grade	1~1	
Department Offered	Mechanical Engin	eering	Beggining grade	M1, M2			
Charge teacher name[Roman alphabet mark]	S1系教務委員, 1系各教員 1kei kyomu Iin−S, 1kei kakukyouin						
Numbering	MEC_MAS61015						
Objectives of class The thesis research aims to pro- understanding of relevant knowled	-	experience	of resea	rch work, and to	o acquire research s	skills with a deep	
Contents of class The research subject depends or research subjects. Discuss with y	-	and the re	esearch	group you join. I	Individual students v	vill have different	
Self Preparation and Review							
Related subjects							
Notes for textbook							
Reference and material will be av	ailable from the sup	pervisor.					
Notes for reference							
Goals to be achieved							
To get something new on individu	al research fields.						
To develop your research skills in Evaluation of achievement	cluding planning an	d presenta	tion skills	5.			
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	s of learning and e	ducation					
Key words							

(M41610030)Thesis Research on Mechanical Engineering[Thesis Research on Mechanical I	Engineering	
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Subject name[English]	Thesis Researc	Thesis Research on Mechanical Engineering[Thesis Research on Mechanical Engineering]						
Schedule number	M41610030	Subject area	Advanced Mechanical Engineering	Required or elective	Required			
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6			
Faculty	Graduate Progr	am for Master's Degre	e	Subject grade	1~			
Department Offered	Mechanical Eng	ineering		Beggining grade	M1, M2			
Charge teacher name[Roma alphabet mark]	n S1系教務委員	,1系各教員 1kei kyor	nu Iin−S, 1kei kak	kukyouin	k			
Numbering	MEC_MAS6101	5						

Objectives of class

A research work of an unresolved engineering problem must be carried out in addition to class to become a leading engineer having creative and applied abilities that is education philosophy of department of mechanical engineering. Through carrying out the supervised research, active studying and researching are developed. By actively studying and researching, the research is developed furthermore. Finally, abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's in the process of the research work.

A research work of an unresolved engineering problem must be carried out in addition to class to become a leading engineer having creative and applied abilities that is education philosophy of department of mechanical engineering. Through carrying out the supervised research, active studying and researching are developed. By actively studying and researching, the research is developed furthermore. Finally, abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's in the process of the research work.

Contents of class

Follow instruction of supervisors.

Follow instruction of supervisors.

Self Preparation and Review

Follow instruction of supervisors. Follow instruction of supervisors.

Related subjects

The work is related to every classes which has been studied in graduate and undergraduate schools.

The work is related to every classes which has been studied in graduate and undergraduate schools.

Notes for textbook

N/A

N/A

Notes for reference

N/A

N/A

Goals to be achieved

Abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's ones in the process of the research work.

Abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's ones in the process of the research work.

Evaluation of achievement

Research work, tangible results, presentation and oral examination in presentation of master theses, etc. are evaluated comprehensively out of a hundred.

Grade levels are C(60% – less than 70%), B(70– less than 80%), A(80% – less than 90%) and S(90% or over).

Research work, tangible results, presentation and oral examination in presentation of master theses, etc. are evaluated comprehensively out of a hundred.

 $Grade \ \text{levels are } C(60\% - \text{less than 70\%}), \ B(70 - \text{less than 80\%}), \ A(80\% - \text{less than 90\%}) \ \text{and} \ S(90\% \ \text{or over}).$

Examination

試験期間中には何も行わない

None during exam period

Details of examination

None during exam period None during exam period Other information For any questions, contact your supervisor. For any questions, contact your supervisor. **Reference URL** N/A N/A Office hours Contact your supervisor. Contact your supervisor. Relations to attainment objectives of learning and education (C)高度な知識を統合的に活用できる実践力・創造力 機械工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践的・創造的能 力を身につけている。 (C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。 (C2)機械工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得して、研究開発の計画を立 案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。 (D) グローバルに活躍できるコミュニケーションカ グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で,自らの考えや成果を効果的に表現するコミュニ ケーション力を身につけている。 (D1)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・発信し, コミュニケーショ ンする能力を身につけている。 (D2)チーム内の個々の要員の価値観を互いに尊重するとともに、協調して、チームとしての目標達成に寄与できる高い能力を身 につけている。 (E)最新の技術や社会環境の変化に対する探究心と持続的学習力 社会,環境,技術等の変化に対応して,生涯にわたって自発的に計画し学習する能力を身につけている。 (C) Practical and creative skills to utilize advanced knowledge in an integrated manner Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge forproblem solving in an integrated manner (C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineering and related fields; and to utilize such knowledge in an integrated manner (C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about mechanical engineering and related fields; to make plans for research and development and put them intopractice: and to create new technologies to solve problems (D) Communication skills for global success Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members (D1) Have the skills to effectively express and communicate one's own ideas as well as points in guestion at home and abroad through papers, oral reports or information media (D2) Have high skills to mutually respect the values of individual team members; and to contribute to the team's achievements through working cooperatively with other team members (E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, environment and technology Kev words Mechanical engineering, Mechanical system design, Materials and manufacturing, System control and robotics, Environment and energy

Mechanical engineering, Mechanical system design, Materials and manufacturing, System control and robotics, Environment and energy

(M4161003T)Thesis Research on Mechanical Engineering Thesis Research on Mec	chanical E	ingineering]
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Subject name[English]	Thesis Researc	Thesis Research on Mechanical Engineering[Thesis Research on Mechanical Engineering]						
Schedule number	M4161003T	Subject area	l	Advanced Mechanical Engineering	Required or elective	Required		
Time of starting a course	Year	Day of week,period	the	Intensive	Credit(s)	6		
Faculty	Graduate Progr	ram for Master's	Degre	e	Subject grade	2~		
Department Offered	Mechanical Eng	Mechanical Engineering				M2		
Charge teacher name[Roman alphabet mark]	S1系教務委員	, 1系各教員 1ke	i kyoı	nu Iin−S, 1kei kak	ukyouin			
Numbering	MEC_MAS6101	5						

Objectives of class

A research work of an unresolved engineering problem must be carried out in addition to class to become a leading engineer having creative and applied abilities that is education philosophy of department of mechanical engineering. Through carrying out the supervised research, active studying and researching are developed. By actively studying and researching, the research is developed furthermore. Finally, abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's in the process of the research work.

A research work of an unresolved engineering problem must be carried out in addition to class to become a leading engineer having creative and applied abilities that is education philosophy of department of mechanical engineering. Through carrying out the supervised research, active studying and researching are developed. By actively studying and researching, the research is developed furthermore. Finally, abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's in the process of the research work.

Contents of class

Follow instruction of supervisors.

Follow instruction of supervisors.

Self Preparation and Review

Follow instruction of supervisors. Follow instruction of supervisors.

Related subjects

The work is related to every classes which has been studied in graduate and undergraduate schools.

The work is related to every classes which has been studied in graduate and undergraduate schools.

Notes for textbook

N/A

N/A

Notes for reference

N/A

N/A

Goals to be achieved

Abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's ones in the process of the research work.

Abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's ones in the process of the research work.

Evaluation of achievement

Research work, tangible results, presentation and oral examination in presentation of master theses, etc. are evaluated comprehensively out of a hundred.

Grade levels are C(60% – less than 70%), B(70– less than 80%), A(80% – less than 90 %) and S(90% or over).

Research work, tangible results, presentation and oral examination in presentation of master theses, etc. are evaluated comprehensively out of a hundred.

 $Grade \ \text{levels are } C(60\% - \text{less than 70\%}), \ B(70 - \text{less than 80\%}), \ A(80\% - \text{less than 90\%}) \ \text{and} \ S(90\% \ \text{or over}).$

Examination

試験期間中には何も行わない

None during exam period

Details of examination

None during exam period None during exam period Other information For any questions, contact your supervisor. For any questions, contact your supervisor. **Reference URL** N/A N/A Office hours Contact your supervisor. Contact your supervisor. Relations to attainment objectives of learning and education (C)高度な知識を統合的に活用できる実践力・創造力 機械工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践的・創造的能 力を身につけている。 (C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。 (C2)機械工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得して、研究開発の計画を立 案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。 (D) グローバルに活躍できるコミュニケーションカ グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で,自らの考えや成果を効果的に表現するコミュニ ケーション力を身につけている。 (D1)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・発信し, コミュニケーショ ンする能力を身につけている。 (D2)チーム内の個々の要員の価値観を互いに尊重するとともに、協調して、チームとしての目標達成に寄与できる高い能力を身 につけている。 (E)最新の技術や社会環境の変化に対する探究心と持続的学習力 社会,環境,技術等の変化に対応して,生涯にわたって自発的に計画し学習する能力を身につけている。 (C) Practical and creative skills to utilize advanced knowledge in an integrated manner Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge forproblem solving in an integrated manner (C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineering and related fields; and to utilize such knowledge in an integrated manner (C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about mechanical engineering and related fields; to make plans for research and development and put them intopractice: and to create new technologies to solve problems (D) Communication skills for global success Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members (D1) Have the skills to effectively express and communicate one's own ideas as well as points in guestion at home and abroad through papers, oral reports or information media (D2) Have high skills to mutually respect the values of individual team members; and to contribute to the team's achievements through working cooperatively with other team members (E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, environment and technology Kev words Mechanical engineering, Mechanical system design, Materials and manufacturing, System control and robotics, Environment and energy

Mechanical engineering, Mechanical system design, Materials and manufacturing, System control and robotics, Environment and energy

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

Subject name[English]	Seminar on Mech	anical Engineering[S	eminar 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	Intensive	Credit(s)	6
		week,period			
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	2~
Department Offered	Mechanical Engin	eering		Beggining	M2
				grade	
Charge teacher name[Roman	S1系教務委員1	kei kyomu Iin−S		± -	l
alphabet mark]					
Numbering	MEC_MAS51015				
Objectives of class					
The seminar aims to provide a b	road understanding	of the mechanical e	ngineering available	for the master the	sis research of a
student.			ingineering available		
The seminar aims to provide a b	road understanding	of the mechanical e	ngineering available	for the master the	sis research of a
student.			ingineering available		
Contents of class					
	amental knowledge	of his /her master +	hasis research wa	rk and the most ad	vanced results in
The class provides both of fund					
the related field by reading res		nonographs. The CC	Incents of the Clas	s depend on the s	Supervisor. TO De
announced by individual supervis		of his /hor mostar +	hadia racaarah	rk and the meat and	vanaed requite :
The class provides both of fund the related field by reading res	-				
		nonographs. The co	muerius of the clas	s depend on the s	supervisor. To b
announced by individual supervis	015.				
Self Preparation and Review					
Given by supervisors.					
Given by supervisors.					
Related subjects					
N/A					
N/A					
Notes for textbook					
Given by supervisors.					
Given by supervisors.					
Notes for reference					
N/A					
N/A					
Goals to be achieved					
To acquire fundamental knowled	ge of individual rese	arch fields.			
To acquire the ability to find pro	blems, the ability to	solve the problems,	and the presentat	on skill.	
To acquire fundamental knowled	e of individual rese				
	50 01 111111111111111111111111111111111	arch fields.			
To acquire the ability to find pro	-		and the presentat	on skill.	
	-		and the presentat	on skill.	
	-		and the presentat	on skill.	
To acquire the ability to find pro	blems, the ability to	solve the problems,	-		
To acquire the ability to find pro	blems, the ability to	solve the problems,	resentation in eacl	n laboratory.	
To acquire the ability to find pro Evaluation of achievement Evaluated comprehensively by co Grade levels are C(60% - less th	blems, the ability to ontent, reports, con an 70%), B(70% – les	solve the problems, siderations, etc. of p is than 80%), A(80% -	resentation in eacl - less than 90%) an	n laboratory. d S(90% or over).	
To acquire the ability to find pro Evaluation of achievement Evaluated comprehensively by co	ontent, reports, con an 70%), B(70% – les ontent, reports, con	solve the problems, siderations, etc. of p s than 80%), A(80% - siderations, etc. of p	resentation in eacl - less than 90%) an resentation in eacl	n laboratory. d S(90% or over). n laboratory.	
To acquire the ability to find pro Evaluation of achievement Evaluated comprehensively by co Grade levels are C(60% – less th Evaluated comprehensively by co	ontent, reports, con an 70%), B(70% – les ontent, reports, con	solve the problems, siderations, etc. of p s than 80%), A(80% - siderations, etc. of p	resentation in eacl - less than 90%) an resentation in eacl	n laboratory. d S(90% or over). n laboratory.	
To acquire the ability to find pro Evaluation of achievement Evaluated comprehensively by co Grade levels are C(60% – less th Evaluated comprehensively by co Grade levels are C(60% – less th Examination	ontent, reports, con an 70%), B(70% – les ontent, reports, con	solve the problems, siderations, etc. of p s than 80%), A(80% - siderations, etc. of p	resentation in eacl - less than 90%) an resentation in eacl	n laboratory. d S(90% or over). n laboratory.	
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Reference URL	
N/A	
N/A	
Office hours	
Contact your supervisor.	
Contact your supervisor.	
Relations to attainment objectives of learning and education	
(C)高度な知識を統合的に活用できる実践力・創造力 機械工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践 力を身につけている。	的·創造的能
(C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身にない。 (C2)機械工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得して、研究開発 案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。	
(D)グローバルに活躍できるコミュニケーションカ グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で、自らの考えや成果を効果的に表現	見するコミュニ
ケーションカを身につけている。 (D1)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・発信し, コミン・オチキャカを良につけている	ミュニケーショ
ンする能力を身につけている。 (D2)チーム内の個々の要員の価値観を互いに尊重するとともに、協調して、チームとしての目標達成に寄与できる につけている。	高い能力を身
(E)最新の技術や社会環境の変化に対する探究心と持続的学習力 社会,環境,技術等の変化に対応して,生涯にわたって自発的に計画し学習する能力を身につけている。	
Have advanced knowledge about mechanical engineering and related fields and have the practical and creative s such knowledge forproblem solving in an integrated manner (C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineering and relat to utilize such knowledge in an integrated manner (C2) Have the skills to learn, by experience, methodologies for research and development through integrat knowledge about mechanical engineering and related fields; to make plans for research and development a intopractice; and to create new technologies to solve problems (D) Communication skills for global success Have the communication skills to effectively express one's own ideas and results while working on issues faced changing society in cooperation with other team members (D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at how through papers, oral reports or information media (D2) Have high skills to mutually respect the values of individual team members; and to contribute to the team's through working cooperatively with other team members	ed fields; and ing extensive and put them by a globally he and abroad
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes environment	
Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, env technology Kay words	ironment and
Key words Mechanical engineering, Mechanical system design, Materials and manufacturing, System control and robotics, Env energy	vironment and
Mechanical engineering, Mechanical system design, Materials and manufacturing, System control and robotics, Env	vironment and

(M41610050)Internship[Internship]

(M41610050)Internship[Internship Subject name[English]	Internship[Intern	ship]			
	M41610050	Subject area	Advanced	Required or	Required
		Julijovi di da	Mechanical	elective	, toquil ou
			Engineering		
Time of starting a course	Year	Day of the	Intensive	Credit(s)	0
-		week,period			
Faculty	Graduate Progra	m for Master's Degr	ee	Subject grade	2~
Department Offered	Mechanical Engir	neering		Beggining	M2
				grade	
Charge teacher name[Roman	S1系教務委員1	lkei kyomu Iin−S			
alphabet mark]					
Numbering	MEC_MAS51015				
Objectives of class					
Students are expected to address	s problems in a s	specialized field in a	company or rese	arch institute. The o	objectives of this
subject are to experience practic	al research and o	development and to	cultivate the prac	tical problem-solvin	g ability, planning
ability, and creativity.					
Students are expected to address	s problems in a s	specialized field in a	company or rese	arch institute. The o	objectives of this
subject are to experience praction	al research and o	development and to	cultivate the prac	tical problem-solvin	g ability, planning
ability, and creativity.					
Contents of class					
In order to cultivate the practical			company/institut	ional supervisors will	provide practical
problems in a specialized field three	ough close commu	inication.			
In order to cultivate the practical		•	company/institut	ional supervisors will	provide practical
problems in a specialized field thr	ough close commu	inication.			
Self Preparation and Review					
Students are expected to discuss	-			-	
Students are expected to discuss	a preferable inter	nship topic with sup	ervisors before st	arting it.	
Related subjects					
N/A					
N/A					
Notes for textbook					
Follow instructions provided by co					
Follow instructions provided by co	ompany/institution	al supervisors.			
Notes for reference					
N/A					
N/A					
Goals to be achieved					
While engaging practical activities				-	ected to improve
the practical problem-solving abili					
While engaging practical activities				-	ected to improve
the practical problem-solving abili	τy, planning ability	, and creativity as w	en as an internatio	onal way of thinking.	
Evaluation of achievement	d		Alexandra ()		/:
Comprehensive evaluation base	u on students i	reports and evalua	uon sneets by	academic and com	pariy/institutional
supervisors. A: 80 or higher (out of 100 points)	B: 65 or higher (out of 100 points) O	. 55 or higher (cut	of 100 points)	
Comprehensive evaluation base	-	-	-	-	nany/institutional
supervisors.		reports and evalua	cion sheets by	academic and com	party/institutional
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Eveningtion					
Examination 試験期間内には何た行わたい					
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Details of examination					
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itions to attainment objectives of learning and education
グローバルに活躍できるコミュニケーションカ ーバルに変化する社会が抱える課題にチームとして協調して取り組む中で,自らの考えや成果を効果的に表現するコミュニ -ションカを身につけている。
⇒コンガをオにつけている。 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・発信し, コミュニケーショ る能力を身につけている。
チーム内の個々の要員の価値観を互いに尊重するとともに, 協調して, チームとしての目標達成に寄与できる高い能力を身 っけている。
Communication skills for global success
e the communication skills to effectively express one's own ideas and results while working on issues faced by a globally nging society in cooperation with other team members
Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad ugh papers, oral reports or information media
Have high skills to mutually respect the values of individual team members; and to contribute to the team's achievements
ugh working cooperatively with other team members
words
rnship

Internship

Subject	Micromachir	ning Engineering[Mic	romachining Engi	neering]		
ame[English]		G G		يى		
Schedule number	M41630040		Subject area	Advanced	Required or	Elective
				Mechanical	elective	
				Engineering		
ime of starting a ourse	a Fall2 term		Day of the week.period	Tue.1~1	Credit(s)	1
aculty	Graduate Pr	rogram for Master's			Subject	1~
					grade	
epartment Offered	Mechanical	Engineering			Beggining grade	M1
harge teache	r 柴田 隆行	SHIBATA Takayuki				
ame[Roman						
alphabet mark]						
Numbering	MEC_MAS53	3025				
Objectives of class						
Micro Electro Med	hanical Sustan	ns" the co-colled	MEMS can be	defined as minia	turized eveter	is that consist
	-				-	
nicromachined sens			-			
nanoscience, photor		•				
echnologies during t		-			als of micromad	runing technologi
microfabrication tec	nnologies), and t	their application in t	ne development c	T WENS devices.		
Contents of class			(
lst week: Introductio		tro Mechanical Syst	em (MEMS)			
2nd week: Photolitho						
3rd week: Wet etchin	•					
4th week: Physical v	apor deposition	(PVD)				
5th week: Chemical \	apor deposition	(CVD)				
6th week: Plating and	d Electroforming					
7th week: Bonding pr	ocesses					
8th week: Presentati	on and discussio					
8th week: Presentati Self Preparation and	on and discussic Review	on	n.			
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8th week: Presentati Self Preparation and Students are require Useful information or Related subjects A fundamental knowl Notes for textbook No textbook is require Useful information or Reference1 Reference2 Reference3 Notes for reference N/A	on and discussion Review d to prepare and MEMS technol edge of physics red for this class mEMS technol Book title Author Book title Author J	on d review each lesson ogies can be obtain and chemistry is re s. ogies can be obtain Fundamentals of Science of Miniat Marc J. Madou Introduction to M Sami Franssila The MEMS Handt Mohamed Gad- el-Hak	ed from the follow equired. d from the follow f Microfabrication Publisher book (2nd ed.) Publisher	ing website; http:// n (2nd ed.): The CRC Press John Wiley & Sons CRC Press	www.memsnet. ISBN Publish year ISBN Publish year ISBN ISBN Publish	org/mems/ 9780849308260 2002 978047085106 2004 978084932106
8th week: Presentati Self Preparation and Students are require Useful information or Related subjects A fundamental knowl Notes for textbook No textbook is require Useful information or Reference1 Reference2 Reference3 Notes for reference V/A Goals to be achieved	on and discussion Review d to prepare and n MEMS technological edge of physics red for this class n MEMS technological Book title Author Book title Author J ding of the fund	on d review each lesson ogies can be obtain and chemistry is re s. ogies can be obtain Fundamentals of Science of Miniat Marc J. Madou Introduction to M Sami Franssila The MEMS Handt Mohamed Gad- el-Hak	ed from the follow equired. ed from the follow f Microfabrication rurization Publisher book (2nd ed.) Publisher book (2nd ed.) Publisher	ing website; http:// n (2nd ed.): The CRC Press John Wiley & Sons CRC Press	www.memsnet. ISBN Publish year ISBN Publish year ISBN ISBN Publish	org/mems/ 9780849308266 2002 978047085106 2004 978084932106
8th week: Presentati Self Preparation and Students are require Useful information or Related subjects A fundamental knowl Notes for textbook No textbook is require Useful information or Reference1 Reference2 Reference3 Notes for reference V/A Goals to be achieved	on and discussion Review d to prepare and n MEMS technol edge of physics red for this class n MEMS technol Book title Author Book title Author ding of the fund e principle and of	on d review each lesson ogies can be obtain and chemistry is re s. ogies can be obtain Fundamentals of Science of Miniat Marc J. Madou Introduction to M Sami Franssila The MEMS Handt Mohamed Gad- el-Hak lamentals of micromer characteristics of ph	ed from the follow equired. ed from the follow f Microfabrication rurization Publisher book (2nd ed.) Publisher book (2nd ed.) Publisher book (2nd ed.) Publisher	ing website; http:// n (2nd ed.): The CRC Press John Wiley & Sons CRC Press	www.memsnet. ISBN Publish year ISBN Publish year ISBN ISBN Publish	org/mems/ 9780849308266 2002 978047085106 2004 978084932106
Bith week: Presentati Self Preparation and Students are require Jseful information or Related subjects A fundamental knowl Notes for textbook No textbook is require Jseful information or Reference1 Reference2 Reference3 Notes for reference V/A Goals to be achieved To gain an understard th	on and discussion Review d to prepare and n MEMS technol edge of physics red for this class n MEMS technol Book title Author Book title Author ding of the fund e principle and co e principle and co	and chemistry is re and chemistry is re and chemistry is re s. ogies can be obtain Fundamentals of Science of Miniat Marc J. Madou Introduction to M Sami Franssila The MEMS Handt Mohamed Gad- el-Hak	ed from the follow equired. d from the follow f Microfabrication rurization Publisher book (2nd ed.) Publisher book (2nd ed.) Publisher book (2nd ed.) Publisher book (2nd ed.) Charles (2nd ed.) Publisher	ing website; http:// n (2nd ed.): The CRC Press John Wiley & Sons CRC Press GRC Press	www.memsnet. ISBN Publish year ISBN Publish year ISBN ISBN Publish	org/mems/ 9780849308266 2002 978047085106 2004 978084932106

(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 MEMS devices will be imposed during the course of class. [Evaluation basis] Students who attend all classes will be evaluated as follows: S: Achieved all goals and obtained total points of the report, 90 or higher (out of 100 points). A: Achieved all goals and obtained total points of the report, 80 or higher (out of 100 points). B: Achieved 80 % of goals and obtained total points of the report, 70 or higher (out of 100 points). C: Achieved 60 % of goals and obtained total points of the report, 60 or higher (out of 100 points). Examination 授業を実施 **Regular Class Details of examination** Note: Regular Class (Presentation and discussion) Other information N/A **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 (C)高度な知識を統合的に活用できる実践力・創造力 機械工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践的・創造的能 力を身につけている。 (C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。 (C2)機械工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得して、研究開発の計画を立 案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。 (C) Practical and creative skills to utilize advanced knowledge in an integrated manner Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge forproblem solving in an integrated manner (C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineering and related fields; and to utilize such knowledge in an integrated manner (C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about mechanical engineering and related fields; to make plans for research and development and put them intopractice; and to create new technologies to solve problems Key words MEMS, Micromachining, Microfabrication, Photolithography, Wet etching, Dry etching, Physical vapor deposition (PVD), Chemical vapor deposition (CVD), Plating, Bonding processes

Subject	uency Analysis Time-freque	ency Analysis and Wav	elet Transform[Tim	e-frequency Anal	vsis and Wavelet	Transform ¹
name[English]					,	
Schedule number	M41630120		Subject area	Advanced Mechanical Engineering	Required or elective	Elective
lime of starting a course	Fall2 term		Day of the week,period	Tue.2~2	Credit(s)	1
Faculty	Graduate Pr	ogram for Master's De			Subject	1~
Department Offered	Mechanical I	Engineering			grade Beggining	M1
Charge teacher	章 忠 SHO	Tadashi			grade	
name[Roman						
alphabet mark]	MEC MAS55	5025				
Numbering	MEC_MASSS	1025				
Objectives of class To obtain advanced kno	wladra of time	-fraguanay analysia	and image processi	ar by utilizing way	alat transform	
To obtain advanced kno To obtain advanced kno	-					
Contents of class			and image processi	ig by utilizing wav		
1. Basic theory of time-	-frequency and	alvsis method will be h	riefly discussed			
1)Shot-Time Fourier tra			anony alouaseu.			
2)The Wigner-Ville Dist						
3)Hilbert Transform and		s frequency analysis				
4)Wavelet transform		s noquonoy analysis				
2.Application of the way	elet Transforr	n will be briefly discus	sed			
1) Time series signal ar		in this be briefly discus				
 Image processing 	1019313					
3) Abnormal detection						
4) Surface inspection						
 Basic theory of time- 	-frequency and	alveic mathad will be h	riefly discussed			
1)Shot-Time Fourier tra		alysis metrioù will be b	meny discussed.			
2)The Wigner-Ville Dist		- fuero analysia				
3)Hilbert Transform and	instantaneou	s frequency analysis				
4)Wavelet transform						
2.Application of the way		n will be briefly discus	sed.			
1) Time series signal ar	alysis					
2) Image processing						
3) Abnormal detection						
4) Surface inspection						
	eview					
Self Preparation and R						
-						
Related subjects						
Related subjects Basic knowledge of the						
Related subjects Basic knowledge of the Basic knowledge of the						
Related subjects Basic knowledge of the Basic knowledge of the Notes for textbook	signal analysis	3				
Self Preparation and R Related subjects Basic knowledge of the Basic knowledge of the Notes for textbook Materials will be perpar	signal analysis	3				
Related subjects Basic knowledge of the Basic knowledge of the Notes for textbook Materials will be perpar	signal analysis ed by lecturer.	5				
Related subjects Basic knowledge of the Basic knowledge of the Notes for textbook Materials will be perpar Materials will be perpar	signal analysis ed by lecturer.	5	ting technologies	for Manufacturing	g ISBN	
Related subjects Basic knowledge of the Basic knowledge of the Notes for textbook Materials will be perpar Materials will be perpar	signal analysis ed by lecturer. ed by lecturer.	Frontiers in compu		for Manufacturing Springer	ISBN	2007
Related subjects Basic knowledge of the Basic knowledge of the Notes for textbook Materials will be perpar Materials will be perpar	signal analysis ed by lecturer. ed by lecturer. Book title	Frontiers in compu				2007
Related subjects Basic knowledge of the Basic knowledge of the Notes for textbook Materials will be perpar Materials will be perpar Reference1	signal analysis ed by lecturer. ed by lecturer. Book title	Frontiers in compu applications Y. Shimizu , Z	. Publisher			2007
Related subjects Basic knowledge of the Basic knowledge of the Notes for textbook	signal analysis ed by lecturer. ed by lecturer. Book title Author Book title	Frontiers in compu applications Y. Shimizu , Z Zhang, R. Batres Wavelets and analy	. Publisher	Springer	Publish year ISBN	2007
Related subjects Basic knowledge of the Basic knowledge of the Notes for textbook Materials will be perpar Materials will be perpar Reference1	signal analysis ed by lecturer. ed by lecturer. Book title Author	Frontiers in compu applications Y. Shimizu , Z Zhang, R. Batres	. Publisher	Springer Oxford	Publish year	2007
Related subjects Basic knowledge of the Basic knowledge of the Notes for textbook Materials will be perpar Materials will be perpar Reference1	signal analysis ed by lecturer. ed by lecturer. Book title Author Book title	Frontiers in compu applications Y. Shimizu , Z Zhang, R. Batres Wavelets and analy	. Publisher	Springer	Publish year ISBN	2007

	Author	R.L. /	Allen,	D.W.	Publisher	IEEE Press	Publish year	
		Mills						
Notes for reference								
Goals to be achieved								
Understanding the know	ledge of the ti	me-freau	encv ar	nalvsis	method and using	g them in real applic	ation	
Understanding the know	-		-	-				
Evaluation of achieveme	ent			-				
Interim report (50%) and	term-end rep	ort (50%)						
Interim report (50%) and	term-end rep	ort (50%)						
Examination								
レポートで実施								
By Report								
Details of examination								
Other information								
Room: D-610, E-mail: zł	nang@me.tut ac	.ip						
Room: D-610, E-mail: zł		•.						
Reference URL	5							
http://is.me.tut.ac.jp								
http://is.me.tut.ac.jp								
Office hours								
Relations to attainment	objectives of	learning a	and edu	cation				
(C)高度な知識を統合的 機械工学およびその関調 力を身につけている。				多得し,	それらを課題解え	夬のために統合的に	活用できる実践的・創造	生的能
(C) Practical and creativ Have advanced knowled such knowledge forprob Key words Wavelet transform, Time	lge about mecl lem solving in a	nanical er an integra	ngineeri	ing and			al and creative skills to r	utilize
Wavelet transform, Time	e-frequency an	alysis						

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

		-		chanical Systems De	1
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	Credit(s)	2
		week,period			
Faculty	_	m for Master's Degr	ee	Subject grade	1~
Department Offered	Mechanical Engi	neering		Beggining	M1
<u></u>	01万批改千号			grade	
Charge teacher name[Roman	S1系教務委員	ikei kyomu lin-S			
alphabet mark]					
Numbering	MEC_MAS53025				
Objectives of class					
This lecture aims to provide a br	oad understanding	of the mechanical s	systems design av	allable for the maste	r thesis researc
work of a student.		C 11			
This lecture aims to provide a br	oad understanding	of the mechanical s	systems design av	allable for the maste	er thesis researc
work of a student.					
Contents of class					
Follow instruction of supervisors.					
Follow instruction of supervisors.					
Self Preparation and Review					
Follow instruction of supervisors.					
Follow instruction of supervisors.					
Related subjects					
Follow instruction of supervisors.					
Follow instruction of supervisors.					
Notes for textbook					
N/A N/A					
Notes for reference					
N/A					
N/A					
Goals to be achieved					
To acquire fundamental knowledg	e of individual res	arch fields			
To acquire the ability to find prob			and the presents	tion chill	
To acquire the ability to find pro-	denis, the ability to		and the presenta	CION SKIII.	
- · · · · · · · · ·	C				
To acquire fundamental knowledg					
To acquire the ability to find prob	plems, the ability to	solve the problems	and the presenta	tion skill.	
Evaluation of achievement					
Coursework, presentation and/or					
Coursework, presentation and/or Grade levels are $C(60\%$ – less that	n 70%), B(70- less	than 80%), A(80% – I	ess than 90 %) an	d S(90% or over).	
Coursework, presentation and/or Grade levels are C(60% - less tha Coursework, presentation and/or	n 70%), B(70– less report.				
Coursework, presentation and/or Grade levels are C(60% - less tha Coursework, presentation and/or Grade levels are C(60% - less tha	n 70%), B(70– less report.				
Coursework, presentation and/or Grade levels are C(60% - less tha Coursework, presentation and/or Grade levels are C(60% - less tha Examination	n 70%), B(70– less report.				
Coursework, presentation and/or Grade levels are C(60% - less tha Coursework, presentation and/or Grade levels are C(60% - less tha Examination 試験期間中には何も行わない	n 70%), B(70– less report.				
Coursework, presentation and/or Grade levels are C(60% - less tha Coursework, presentation and/or Grade levels are C(60% - less tha Examination 試験期間中には何も行わない None during exam period	n 70%), B(70– less report.				
Coursework, presentation and/or Grade levels are C(60% - less tha Coursework, presentation and/or Grade levels are C(60% - less tha Examination 試験期間中には何も行わない None during exam period Details of examination	n 70%), B(70– less report.				
Coursework, presentation and/or Grade levels are C(60% - less tha Coursework, presentation and/or Grade levels are C(60% - less tha Examination 試験期間中には何も行わない None during exam period Details of examination N/A	n 70%), B(70– less report.				
Coursework, presentation and/or Grade levels are C(60% - less tha Coursework, presentation and/or Grade levels are C(60% - less tha Examination 試験期間中には何も行わない None during exam period Details of examination N/A N/A	n 70%), B(70– less report.				
Coursework, presentation and/or Grade levels are C(60% - less tha Coursework, presentation and/or Grade levels are C(60% - less tha Examination 試験期間中には何も行わない None during exam period Details of examination N/A N/A Other information	in 70%), B(70- less report. in 70%), B(70- less				
Coursework, presentation and/or Grade levels are C(60% - less tha Coursework, presentation and/or Grade levels are C(60% - less tha Examination 試験期間中には何も行わない None during exam period Details of examination N/A N/A Other information For any questions, contact your s	n 70%), B(70- less report. in 70%), B(70- less supervisor.				
Coursework, presentation and/or Grade levels are C(60% - less tha Coursework, presentation and/or Grade levels are C(60% - less tha Examination 試験期間中には何も行わない None during exam period Details of examination N/A N/A Other information For any questions, contact your s For any questions, contact your s	n 70%), B(70- less report. in 70%), B(70- less supervisor.				
Coursework, presentation and/or Grade levels are C(60% - less tha Coursework, presentation and/or Grade levels are C(60% - less tha Examination 試験期間中には何も行わない Note during exam period Details of examination N/A N/A Other information For any questions, contact your s For any questions, contact your s Reference URL	n 70%), B(70- less report. in 70%), B(70- less supervisor.				
Coursework, presentation and/or Grade levels are C(60% - less tha Coursework, presentation and/or Grade levels are C(60% - less tha Examination 試験期間中には何も行わない None during exam period Details of examination N/A N/A Other information For any questions, contact your s For any questions, contact your s Reference URL N/A	n 70%), B(70- less report. in 70%), B(70- less supervisor.				
Coursework, presentation and/or Grade levels are C(60% - less tha Coursework, presentation and/or Grade levels are C(60% - less tha Examination 試験期間中には何も行わない None during exam period Details of examination N/A N/A Other information For any questions, contact your s For any questions, contact your s Reference URL	n 70%), B(70- less report. in 70%), B(70- less supervisor.				

Contact your supervisor.

Relations to attainment objectives of learning and education

(C)高度な知識を統合的に活用できる実践力・創造力

機械工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践的・創造的能 カを身につけている。

(C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。 (C2)機械工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得して、研究開発の計画を立 案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge forproblem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineering and related fields; and to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about mechanical engineering and related fields; to make plans for research and development and put them intopractice; and to create new technologies to solve problems

Key words

Mechanical Systems Design Mechanical Systems Design

Subject name[English]	Advanced Materials and Manufacturing Process I[Advanced Materials and Manufacturi Process I]							
Schedule number	M41630230	Subject area	Advanced Mechanical Engineering	Required or elective	Elective			
Time of starting a course	Fall term	Day of the week,period	Tue.4~4	Credit(s)	2			
Faculty	Graduate Progr	am for Master's Degre	e	Subject grade	1~			
Department Offered	Mechanical Eng	ineering		Beggining	M1			
Charge teacher name[Roman alphabet mark]	S1系教務委員	S1系教務委員 1kei kyomu Iin−S						
Numbering	MEC_MAS5402	MEC MAS54025						
Objectives of class								
This lecture aims to provide a b work of a student. This lecture aims to provide a b work of a student. Contents of class	road understandin	-						
Follow instruction of supervisors Follow instruction of supervisors								
Self Preparation and Review	•							
Follow instruction of supervisors								
Follow instruction of supervisors								
Related subjects								
Follow instruction of supervisors								
Follow instruction of supervisors Notes for textbook	•							
N/A								
N/A								
Notes for reference								
N/A								
N/A								
Goals to be achieved								
To acquire fundamental knowled	ge of individual res	search fields.						
To acquire the ability to find pro	blems, the ability t	to solve the problems	and the presenta	ition skill.				
To acquire fundamental knowled To acquire the ability to find pro	-		and the presenta	tion skill.				
Evaluation of achievement								
Coursework, presentation and/or								
Grade levels are C(60% - less th		s than 80%), A(80% – I	ess than 90 %) ar	nd S(90% or over).				
Coursework, presentation and/or Grade levels are C(60% - less the		c than 80%) A(00% 1	acc than 00 ≥)	od S(00% or over)				
Examination	an 70/07, D(70- les	5 man 00/0/, A(00/0 - 1	55 (11a11 90 %) ar					
試験期間中には何も行わない								
None during exam period								
Details of examination								
N/A								
N/A Other information								
For any questions, contact your	supervisor							
For any questions, contact your For any questions, contact your	•							
Reference URL								
N/A								

Contact your supervisor. Contact your supervisor.

Relations to attainment objectives of learning and education

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機械工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践的・創造的能 カを身につけている。

(C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。 (C2)機械工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得して、研究開発の計画を立 案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。

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Key words

Materials, Manufacturing Process

Materials, Manufacturing Process

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

Subject name[English]	Advanced System, Control and Robotics I[Advanced System, Control and Robotics I]					
Schedule number	M41630250	Subject area	Advanced	Required or	Elective	
			Mechanical	elective		
Time of starting	Fell terre	Davis of the	Engineering	Oue dit/-)	0	
Time of starting a course	Fall term	Day of the week.period	Wed.4~4	Credit(s)	2	
Faculty	Graduate Program	n for Master's Degre		Subject grade	1~	
Department Offered	Mechanical Engin			Beggining	M1	
				grade		
Charge teacher name[Roman	S1系教務委員1	kei kyomu Iin−S			4	
alphabet mark]						
Numbering	MEC_MAS55025					
Objectives of class						
This lecture aims to provide a b	road understanding	of the mechanical s	ystems design av	vailable for the maste	er thesis research	
work of a student.						
This lecture aims to provide a b	road understanding	of the mechanical s	ystems design av	vailable for the maste	er thesis research	
work of a student.						
Contents of class						
Follow instruction of supervisors						
Follow instruction of supervisors	•					
Self Preparation and Review						
Follow instruction of supervisors						
Follow instruction of supervisors	•					
Related subjects						
Follow instruction of supervisors						
Follow instruction of supervisors	•					
Notes for textbook						
N/A						
N/A						
Notes for reference						
N/A						
N/A Goals to be achieved						
To acquire fundamental knowled	-					
To acquire the ability to find pro	piems, the ability to	solve the problems	and the presenta	tion skill.		
To acquire fundamental knowled						
To acquire the ability to find pro	blems, the ability to	solve the problems	and the presenta	tion skill.		
Evaluation of achievement						
Coursework, presentation and/or						
Grade levels are C(60% - less th		tnan 80%), A(80% – I	ess than 90 %) an	a 5(90% or over).		
Coursework, presentation and/or C course of C courses of C	-					
Grade levels are C(60% - less th	an 70%), B(70- less	unari ou%), A(80% -	ess man 90 %) an	u 3(90% or over).		
Examination						
試験期間中には何も行わない						
None during exam period Details of examination						
N/A						
N/A Other information						
For any questions, contact your	•					
For any questions, contact your	supervisor.					
Reference URL						
N/A						
N/A						
Office hours						
Contact your supervisor.						

Contact your supervisor.

Relations to attainment objectives of learning and education

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(C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。 (C2)機械工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得して、研究開発の計画を立 案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。

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(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about mechanical engineering and related fields; to make plans for research and development and put them intopractice; and to create new technologies to solve problems

Key words

System, Control, Robotics System, Control, Robotics

Advanced Energy and Environmental Engineering I[Advanced Energy and Environ Engineering I]				
M41630270	Subject area	Advanced Mechanical	Required or elective	Elective
Fall term	Day of the week,period	Fri.1~1	Credit(s)	2
Graduate Program	n for Master's Deg	ree	Subject grade	1~
Mechanical Engine	eering		Beggining grade	M1
S1系教務委員 1	kei kyomu Iin−S			
MEC_MAS56025				
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·				
-		and the presenta	tion skill.	
		and the presenta	tion skill.	
an 70%), B(70− less t report.				
		un		
Supervisor.				
	Engineering [] M41630270 Fall term Graduate Program Mechanical Engine S1系教務委員 11 MEC_MAS56025 road understanding of road understand	Engineering [] M41630270 Subject area Fall term Day of the week,period Graduate Program for Master's Degr Mechanical Engineering S1系教務委員 1kei kyomu Iin-S MEC_MAS56025 road understanding of the mechanical road understanding of the mechanical road understanding of the mechanical solems, the ability to solve the problems ge of individual research fields. plems, the ability to solve the problems ge of individual research fields. plems, the ability to solve the problems ge of individual research fields. plems, the ability to solve the problems ge of individual research fields. plems, the ability to solve the problems ge of individual research fields. plems, the ability to solve the problems ge of individual research fields. plems, the ability to solve the problems ge of individual research fields. plems, the ability to solve the problems for report. an 70%), B(70- less than 80%), A(80% - for report. an 70%), B(70- less than 80%), A(80% -	Engineering [] M41630270 Subject area Advanced Mechanical Engineering Fall term Day of the week.period Fri.1~1 Graduate Program for Master's Degree Mechanical Engineering S1系教務委員 1kei kyomu lin-S MEC_MAS56025 oad understanding of the mechanical systems design av oad understanding of the mechanical systems design av oad understanding of the mechanical systems design av e of individual research fields. ge of individual research fields. blems, the ability to solve the problems and the presenta greport. an 70%), B(70- less than 80%), A(80% - less than 90 %) an report. an 70%), B(70- less than 80%), A(80% - less than 90 %) an report. an 70%), B(70- less than 80%), A(80% - less than 90 %) an	Engineering I] Multiple target Advanced Mechanical Engineering Required or elective Fall term Day of the week,period Fri.1~1 Credit(s) Graduate Program for Master's Degree Subject grade Mechanical Engineering Beggining grade S1系教務委員 1kei kyomu lin-S MEC_MASS6025 oad understanding of the mechanical systems design available for the master oad understanding of the mechanical systems design available for the master oad understanding of the mechanical systems design available for the master ge of individual research fields. Jelems, the ability to solve the problems and the presentation skill. report. an 70%), B(70- less than 80%), A(80% - less than 90 %) and S(90% or over). report. an 70%), B(70- less than 80%), A(80% - less than 90 %) and S(90% or over). supervisor.

Contact your supervisor. Contact your supervisor.

Relations to attainment objectives of learning and education

(C)高度な知識を統合的に活用できる実践力・創造力

機械工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践的・創造的能 カを身につけている。

(C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。 (C2)機械工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得して、研究開発の計画を立 案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。

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Key words

Energy, Environment Energy, Environment

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

Subject name[English]	Advances in Mec	hanical Design[Adva	nces 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 week,period	Tue.1~1	Credit(s)	2
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	2~
Department Offered	Mechanical Engin	eering		Beggining grade	M2
Charge teacher name[Roman alphabet mark]	柴田 隆行,河村	庄造 SHIBATA Tal	kayuki, KAWAMURA	A Shozo	
Numbering	MEC_MAS53025				
Objectives of class					
Fall 2 : Micromachining Engineerin "Micro Electro Mechanical Sys micromachined sensors, actuato nanoscience, photonics, bio-ele technologies during the past deca (microfabrication technologies), a	stems", the so-ca ors, passive compo ctrochemical syste ade. The objective	onents, and integra ems, and so on. Th of this course is to i	ted circuits (IC) f he MEMS field ha introduce fundamer	for applications in as been one of th	micromechanics e most exciting
Spring 1 : Vibration Engineering (This lecture will provide the kno		analysis method and	l component mode	synthesis method	to treat a huge
degree of freedom system.					
Contents of class					
Fall 2 : Micromachining Engineering	-				
1st week: Introduction of Micro E	lectro Mechanical	System (MEMS)			
2nd week: Photolithography					
3rd week: Wet etching and Dry et					
4th week: Physical vapor depositi					
5th week: Chemical vapor deposit					
6th week: Plating and Electroform	ning				
7th week: Bonding processes					
8th week: Presentation and discu	ission				
Spring 1 : Vibration Engineering (I	Kawamura)				
Modal analysis for multi degree o	f freedom system				
1: Introduction of modal analysis,					
2: A system with proportional vise					
3: A system with proportional viso					
4: Compensate of higher vibration	n modes				
Component mode synthesis meth	nod				
5: Formulation of sub-systems					
6: Modal synthesis using constrai					
7: Modal synthesis using constrai					
8: Modal synthesis using non-con Self Preparation and Review	ISCIAINC MODES				
Fall 2 : Micromachining Engineerir	ng (Shihata)				
Students are required to prepare	-	sson			
Useful information on MEMS tech			wing website; http:/	//www.memsnet.org	g/mems/
Spring 1 : Vibration Engineering (I	Kawamura)				
Spring 1 : Vibration Engineering (I Self-preparation and review are r					
Self-preparation and review are r	necessary.				
Self-preparation and review are r Related subjects	necessary. ng (Shibata)	is required.			

Notes for text	ration engineering, Mechanical vibration book
	nachining Engineering (Shibata)
	s required for this class. Handouts will be prepared.
	ation on MEMS technologies can be obtained from the following website; http://www.memsnet.org/mems/
	ration Engineering (Kawamura)
Handouts will	
Notes for refe	
	nachining Engineering (Shibata)
	als of Microfabrication (2nd ed.): The Science of Miniaturization
	u, CRC Press, 2002, ISBN: 9780849308260
•	n to Microfabrication
	a, John Wiley & Sons, 2004, ISBN: 9780470851067 Handbook (2nd ed.)
	⊢el−Hak, CRC Press, 2006, ISBN: 9780849321061
Goals to be ad	
	nachining Engineering (Shibata)
	derstanding of the fundamentals of micromachining technologies for MEMS.
	and the principle and characteristics of photolithography.
	and the principle and characteristics of etching processes.
	and the principle and characteristics of deposition processes.
	and the principle and characteristics of bonding processes.
(5) To apply ki	nowledge of micromachining technologies to the design and manufacturing of microdevices.
Spring 1 : Vibr	ation Engineering (Kawamura)
(1) Understand	d the modal analysis for multi degree of freedom system
(2) Understand	d the component mode synthesis method
Evaluation of a	achievement
Fall 2 : Microm	nachining Engineering (Shibata)
	be evaluated by presentation (70%) and classroom performance (30%). An oral presentation on micromachining
-	or the fabrication of MEMS devices will be imposed during the course of class.
-	sis] Students who attend all classes will be evaluated as follows:
	Il goals and obtained total points of the report, 90 or higher (out of 100 points).
	Il goals and obtained total points of the report, 80 or higher (out of 100 points). 0% of mode and obtained total points of the way at 70 problems (set of 100 points).
	0 % of goals and obtained total points of the report, 70 or higher (out of 100 points). 0 % of goals and obtained total points of the report, 60 or higher (out of 100 points).
O. Achieved of	
Spring 1 : Vibr	ation Engineering (Kawamura)
	t (full score 100).
Level: achieve	ment in the case upper 60 points.
	r 90 points, Level A: upper 80 points, Level B: upper 70 points, Level C: upper 60 points
Examination	
レポートで実施	Ē
By Report	
Details of examination	mination
Note	anakining Engine wing (Shihata)
	nachining Engineering (Shibata) (Presentation and discussion)
Other information	· ·
	uon nachining Engineering (Shibata)
	nachining Engineering (Shibata) m: Prof. Takayuki Shibata, E-Mail: shibata@me.tut.ac.jp
- oncor perso	
Spring 1 : Vibr	ation Engineering (Kawamura)
Contact perso	n: Prof. Shozo Kawamura E-Mail:kawamura@me.tut.ac.jp
Reference UR	L
Fall 2 (Shibata	ı) : https://www.tut.ac.jp/english/schools/faculty/me/64.html
Spring 1 (Kawa	amura) : https://www.tut.ac.jp/english/schools/faculty/me/561.html
Office hours	

Spring 1 : Vibration Engineering (Kawamura) Ask by E-mail.

Relations to attainment objectives of learning and education

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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

Subject name[Englis]	-	Thermal and Fluid N	Mechanics[Advance	s in Thermal and	Fluid Mechanics]	
Schedule number	M41630350		Subject area	Advanced	Required or	Elective
				Mechanical	elective	
				Engineering		
Time of starting	a Fall term		Day of the	Thu.2~2	Credit(s)	2
course			week,period			
Faculty	Graduate Pr	ogram for Master's I		<u>.</u>	Subject	2~
					grade	
Department Offered	Mechanical E	Engineering			Beggining	M2
					grade	
Charge teach	er 柳田秀記,	中村 祐二 YANAD	A Hideki, NAKAMUF	RA Yuji		
name[Roman alphab	ət					
mark]						
Numbering	MEC_MAS56	025				
Objectives of class						
Fluid power systems	utilize pressurize	d fluid (oil, air, water	r) to transfer power	r and output mech	anical power thro	ugh fluid pov
actuators. Thermal p	ower systems uti	ilize thermal energy	obtained by chemi	cal reaction to tra	ansfer mechanical	power throu
the energy conversio	n devices.					
In this class, student	s acquire knowle	dge of structures a	and theories of fluid	d and thermal pov	ver components a	ind systems
well as dynamics of	fluid in pipelines.	. In addition, studer	nts acquire informa	tion on recent to	pics of fluid and	thermal pow
engineering.						
Contents of class						
1st week:Introductior	to fluid power sy	ystems				
2nd week:Structures		-	nts			
3rd week:Power loss						
4th week:Dynamics o				uuation)		
5th week:Dynamics o						
6th week:Dynamics o						
7th week:Recent topi		-	,			
8th week:Recent top	-		nd examination (45	min)		
·	·	•				
9th week: Introductio	n to combustion i	nhenomena				
10th week: Governing			on			
11th week: chemical						
12th week: Ignition	cuotion					
13th week: One-dime	nsional flame the	orv				
14th week: Fendell ci		ory				
15th week: multi-pha						
16th week: Examinati						
Self Preparation and						
•			4 h a 1 a a 4 a 1 a a a h a a			
Students are request	ed to review each	n class and prepare	the next class by r	eauing the teachir	ig material.	
Related subjects						
Fluid mechanics, Mat	nematics (comple	x variables, Laplace	transtorm), Chemic	cal reaction, Heat	transter	
Notes for textbook						
No Textbook is requi	red					
Reference1	Book title	Fluid Transients i	in Systems		ISBN	
	Author	Wylie, Streeter	7. Publisher	McGraw-Hill	Publish year	
		Lisheng				
Reference2	Book title	Fundamental Asp	ects of Combustion	n	ISBN	0-19-
						507626-5
	Author	A. Linan and F.A	. Publisher	Oxford Press	Publish year	1993
	Audioi			1		
	Audioi	Williams				
Notes for reference	Audior	Williams				
Notes for reference		Williams				

(M41630350)Advances in Thermal and Fluid Mechanics[Advances in Thermal and Fluid Mechanics]

To understand structures and characteristics of fluid power components

To be able to calculate output and efficiency of fluid power components and systems

To be able to derive basic equations of fluid in pipeline

To understand water/oil hammer

To understand recent topics of fluid power systems

Learn what is the effective mathematical approach (with proper simplification) to solve combustion problem theoretically.

Evaluation of achievement

Each student's achievement is evaulated by the sum of examination (50%) and reports (50%).

Students will be evaluated as follows:

S: Obtained total points of exam and reports, 90 or higher (out of 100 points).

A: Obtained total points of exam and reports, 80 or higher (out of 100 points).

B: Obtained total points of exam and reports, 70 or higher (out of 100 points).

C: Obtained total points of exam and reports, 60 or higher (out of 100 points).

Examination

定期試験を実施(対面)

Examination(Face to Face)

Details of examination

Each student has to take a calculator with him/her.

Other information

Prof.Yanada

Room: D309, Tel.(Ext.): 6668, e-mail: yanada@me.tut.ac.jp

Prof.Nakamura

Room: D311, Tel.(Ext.): 6647, e-mail: yuji@me.tut.ac.jp

Reference URL

N/A

Office hours

Basically, any time is OK. The time for discussion can be determined through e-mails when instructor is absent from his/her office.

Relations to attainment objectives of learning and education

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Key words

Fluid power, Wave propagation, Water hammer, Unsteady flow, Oscillatory flow, Combustion, Reacting flow

(M41630380)Robotics[Robotics]

name[English]	T OBOCIOSEI (O	botics]				
Schedule number	M41630380		Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting course	a Fall term		Day of the week,period	Fri.2~2	Credit(s)	2
Faculty	Graduate Pr	ogram for Master's Do			Subject grade	2~
Department Offered	Mechanical	Engineering			Beggining grade	M2
Charge teache		UCHIYAMA Naoki				
name[Roman alphabe	et 🛛					
mark]						
Numbering	MEC_MAS55	025				
Objectives of class						
		inematics, dynamics a	and motion control	ot multiple rigid-bo	dies connected	in series v
revolute or prismatic	joints.					
Contents of class	d human from 11	of monthly and the state	tations in 2 D			
-		of positions and orien	-	ce		
		ntations in 3-D space orientations of rigid-o				
1–2. Transformation (1–3. Properties of tra	-	-	ojouta.			
2. Kinematics						
	elative positions	and orientations of ma	anipulator links			
-	-	ositions and orientatio				
2–3. Inverse kinemati						
 Velocities and stat 						
3–1. Linear and rotat		f rigid-objects.				
3–2. Velocities of ma		J				
3-3. Static forces in	manipulators.					
3-3. Static forces in 4. Dynamics	manipulators.					
4. Dynamics 4−1. Review of rigid–l	body dynamics.	mulations of manipula	tor dynamics.			
4. Dynamics 4−1. Review of rigid–l	body dynamics.	mulations of manipula	tor dynamics.			
4. Dynamics 4–1. Review of rigid–I 4–2. Newton–Euler ar	body dynamics.	mulations of manipula	tor dynamics.			
4. Dynamics 4–1. Review of rigid–I 4–2. Newton–Euler ar 5. Control	body dynamics. nd Lagrangian for	mulations of manipula	tor dynamics.			
4. Dynamics 4–1. Review of rigid–I 4–2. Newton–Euler ar 5. Control 5–1. Linear control.	body dynamics. nd Lagrangian for ol.	mulations of manipula	tor dynamics.			
4. Dynamics 4–1. Review of rigid–I 4–2. Newton–Euler ar 5. Control 5–1. Linear control. 5–2. Nonlinear control	body dynamics. nd Lagrangian for nl. Review		tor dynamics.			
4. Dynamics 4–1. Review of rigid–I 4–2. Newton–Euler ar 5. Control 5–1. Linear control. 5–2. Nonlinear contro Self Preparation and	body dynamics. nd Lagrangian for nl. Review		tor dynamics.			
4. Dynamics 4–1. Review of rigid–1 4–2. Newton–Euler ar 5. Control 5–1. Linear control. 5–2. Nonlinear contro Self Preparation and Read the handouts br Related subjects	body dynamics. nd Lagrangian for l. Review efore the lecture					
4. Dynamics 4–1. Review of rigid–1 4–2. Newton–Euler ar 5. Control 5–1. Linear control. 5–2. Nonlinear contro Self Preparation and Read the handouts br Related subjects	body dynamics. nd Lagrangian for l. Review efore the lecture					
4. Dynamics 4–1. Review of rigid–1 4–2. Newton–Euler ar 5. Control 5–1. Linear control. 5–2. Nonlinear contro Self Preparation and Read the handouts be Related subjects Fundamentals of linea Notes for textbook	body dynamics. nd Lagrangian for l. Review efore the lecture ar algebra, mecha					
4. Dynamics 4–1. Review of rigid–1 4–2. Newton–Euler ar 5. Control 5–1. Linear control. 5–2. Nonlinear contro Self Preparation and Read the handouts b Related subjects Fundamentals of linea	body dynamics. nd Lagrangian for l. Review efore the lecture ar algebra, mecha		ry.	and Control, 3rd	ISBN	
4. Dynamics 4–1. Review of rigid–l 4–2. Newton–Euler ar 5. Control 5–1. Linear control. 5–2. Nonlinear contro Self Preparation and Read the handouts be Related subjects Fundamentals of linear Notes for textbook Handouts will be prep	body dynamics. nd Lagrangian for l. Review efore the lecture ar algebra, mecha	anics and control theo Introduction to Ro	ry.	and Control, 3rd	ISBN Publish year	2005
4. Dynamics 4–1. Review of rigid–I 4–2. Newton–Euler ar 5. Control 5–1. Linear control. 5–2. Nonlinear control Self Preparation and Read the handouts be Related subjects Fundamentals of linea Notes for textbook Handouts will be prep Reference1	body dynamics. Ind Lagrangian for Review efore the lecture ar algebra, mecha bared. Book title	anics and control theo Introduction to Ro Edition	ory. obotics: Mechanics Publisher			2005
4. Dynamics 4–1. Review of rigid–I 4–2. Newton–Euler ar 5. Control 5–1. Linear control. 5–2. Nonlinear control Self Preparation and Read the handouts be Related subjects Fundamentals of linea Notes for textbook Handouts will be prep Reference1	body dynamics. Ind Lagrangian for St. Review efore the lecture ar algebra, mecha bared. Book title Author Book title	anics and control theo Introduction to Ro Edition J. J. Craig Robot Modeling and	ory. bbotics: Mechanics Publisher d Control	Prentice Hall	Publish year ISBN	
4. Dynamics 4–1. Review of rigid–I 4–2. Newton–Euler ar 5. Control 5–1. Linear control. 5–2. Nonlinear control Self Preparation and Read the handouts be Related subjects Fundamentals of linea Notes for textbook Handouts will be prep Reference1	body dynamics. Ind Lagrangian for Pl. Review efore the lecture ar algebra, mecha bared. Book title Author	anics and control theo Introduction to Ro Edition J. J. Craig	ory. botics: Mechanics Publisher d Control Publisher		Publish year	2005
4. Dynamics 4–1. Review of rigid–1 4–2. Newton–Euler ar 5. Control 5–1. Linear control. 5–2. Nonlinear control Self Preparation and Read the handouts br Related subjects Fundamentals of linea Notes for textbook Handouts will be prep Reference1 Reference2	body dynamics. Ind Lagrangian for St. Review efore the lecture ar algebra, mecha bared. Book title Author Book title	anics and control theo Introduction to Ro Edition J. J. Craig Robot Modeling and M. W. Spong, S. Hutchinson, M	ory. botics: Mechanics Publisher d Control Publisher	Prentice Hall John Wiley &	Publish year ISBN	
4. Dynamics 4–1. Review of rigid–I 4–2. Newton–Euler ar 5. Control 5–1. Linear control. 5–2. Nonlinear contro Self Preparation and Read the handouts be Related subjects Fundamentals of linear Notes for textbook Handouts will be prep	body dynamics. Ind Lagrangian for St. Review efore the lecture ar algebra, mecha bared. Book title Author Book title	anics and control theo Introduction to Ro Edition J. J. Craig Robot Modeling and M. W. Spong, S. Hutchinson, M	ory. botics: Mechanics Publisher d Control Publisher	Prentice Hall John Wiley &	Publish year ISBN	
4. Dynamics 4-1. Review of rigid-I 4-2. Newton-Euler ar 5. Control 5-1. Linear control. 5-2. Nonlinear control Self Preparation and Read the handouts br Related subjects Fundamentals of linea Notes for textbook Handouts will be prep Reference2 Notes for reference	body dynamics. Ind Lagrangian for Review efore the lecture ar algebra, mecha bared. Book title Author Book title Author	anics and control theo Introduction to Ro Edition J. J. Craig Robot Modeling and M. W. Spong, S. Hutchinson, M	ory. botics: Mechanics Publisher d Control Publisher	Prentice Hall John Wiley &	Publish year ISBN	
4. Dynamics 4-1. Review of rigid-I 4-2. Newton-Euler ar 5. Control 5-1. Linear control. 5-2. Nonlinear control Self Preparation and Read the handouts br Related subjects Fundamentals of linea Notes for textbook Handouts will be prep Reference1 Reference2 Notes for reference N/A Goals to be achieved	body dynamics. Ind Lagrangian for Review efore the lecture ar algebra, mecha bared. Book title Author Book title Author	anics and control theo Introduction to Ro Edition J. J. Craig Robot Modeling and M. W. Spong, S. Hutchinson, M	ory. bbotics: Mechanics Publisher d Control Publisher	Prentice Hall John Wiley &	Publish year ISBN	
4. Dynamics 4-1. Review of rigid-I 4-2. Newton-Euler ar 5. Control 5-1. Linear control. 5-2. Nonlinear control Self Preparation and Read the handouts br Related subjects Fundamentals of linea Notes for textbook Handouts will be prep Reference1 Reference2 Notes for reference N/A Goals to be achieved Be able to derive kind	body dynamics. Ind Lagrangian for Review efore the lecture ar algebra, mecha bared. Book title Author Book title Author I ematics and dyna	anics and control theo Introduction to Ro Edition J. J. Craig Robot Modeling and M. W. Spong, S Hutchinson, M Vidyasagar	pry. bbotics: Mechanics Publisher d Control Publisher bulators.	Prentice Hall John Wiley &	Publish year ISBN	
4. Dynamics 4-1. Review of rigid-I 4-2. Newton-Euler ar 5. Control 5-1. Linear control. 5-2. Nonlinear control Self Preparation and Read the handouts br Related subjects Fundamentals of linea Notes for textbook Handouts will be prep Reference1 Reference2 Notes for reference N/A Goals to be achieved Be able to derive kind	body dynamics. Ind Lagrangian for Proview efore the lecture ar algebra, mecha pared. Book title Author Book title Author I ematics and dyna tion controllers f	anics and control theo Introduction to Ro Edition J. J. Craig Robot Modeling and M. W. Spong, S Hutchinson, M Vidyasagar	pry. bbotics: Mechanics Publisher d Control Publisher bulators.	Prentice Hall John Wiley &	Publish year ISBN	

The credit of this course is given if the score of the above examination is 60% or over. Grade levels are C (60% - less than 70%), B (70 - less than 80%), A (80 - less than 90%) and S (90% or over). **Examination** 定期試験を実施(対面)

Examination(Face to Face)
Details of examination

N/A

Other information

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

Reference URL N/A

Office hours

Contact the lecturer by e-mail first.

Relations to attainment objectives of learning and education

機械工学専攻

(C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。

Graduate Program of Mechanical Engineering for Master's Degree (C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineering and related fields; and to utilize such knowledge in an integrated manner

Key words

Manipulator, Dynamics, Control

(M41630400)Robot Kinematics[Robot Kinematics]

name[English]	Robot Kinem	natics[Robot Kinematic	s]			
Schedule number	M41630400		Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting course	a Fall1 term		Day of the week,period	Fri.2~2	Credit(s)	1
Faculty	Graduate Pr	ogram for Master's De	gree		Subject grade	1~
Department Offered	Mechanical E	Engineering			Beggining grade	M1
Charge teach name[Roman alphab mark]		JCHIYAMA Naoki				
Numbering	MEC_MAS55	025				
1–1. Description of µ 1–2. Transformation 1–3. Properties of tr 2. Kinematics 2–1. Description of µ 2–2. Transformation 2–3. Inverse kinema 3. Velocities and sta 3–1. Linear and rota	positions and orier of positions and or ransformation matr relative positions a of manipulator po tics. tic forces	and orientations of mai sitions and orientation	jects. nipulator links.	ce		
3-3. Static forces in Self Preparation and Read the handouts I Related subjects Fundamentals of line Notes for textbook	n manipulators. d Review before the lecture. ear algebra and me					
3-2. Velocities of m 3-3. Static forces in Read the handouts I Related subjects Fundamentals of line Notes for textbook Handouts will be pre Reference1	n manipulators. d Review before the lecture. ear algebra and me		potics: Mechanics	and Control, 3rd	ISBN	
3–3. Static forces in Self Preparation and Read the handouts I Related subjects Fundamentals of line Notes for textbook Handouts will be pre	a manipulators. d Review before the lecture. ear algebra and me epared. Book title	achanics. Introduction to Rol Edition	1	,		
3-3. Static forces in Self Preparation and Read the handouts I Related subjects Fundamentals of line Notes for textbook Handouts will be pre Reference1	a manipulators. d Review before the lecture. ear algebra and me epared. Book title Author	Introduction to Rol Edition J. J. Craig	Publisher	and Control, 3rd	Publish year	2005
3–3. Static forces in Self Preparation and Read the handouts I Related subjects Fundamentals of line Notes for textbook Handouts will be pre	a manipulators. d Review before the lecture. ear algebra and me epared. Book title	achanics. Introduction to Rol Edition	Publisher	,		2005
3-3. Static forces in Self Preparation and Read the handouts I Related subjects Fundamentals of line Notes for textbook Handouts will be pre Reference1 Reference2	a manipulators. d Review before the lecture. ear algebra and me spared. Book title Author Author	Introduction to Rob Edition J. J. Craig Robot Modeling and M. W. Spong, S. Hutchinson, M.	Publisher Control	Prentice Hall John Wiley &	Publish year ISBN	
3-3. Static forces in Self Preparation and Read the handouts I Related subjects Fundamentals of line Notes for textbook Handouts will be pre Reference1 Reference2 Notes for reference N/A	a manipulators. d Review before the lecture. ear algebra and me spared. Book title Author Book title Author	Introduction to Rob Edition J. J. Craig Robot Modeling and M. W. Spong, S. Hutchinson, M.	Publisher Control	Prentice Hall John Wiley &	Publish year ISBN	
3-3. Static forces in Self Preparation and Read the handouts I Related subjects Fundamentals of line Notes for textbook Handouts will be pre Reference1 Reference2 Notes for reference N/A Goals to be achieve Be able to derive kin Evaluation of achieve	a manipulators. d Review before the lecture. ear algebra and me spared. Book title Author Book title Author d nematics of robotion rement	echanics. Introduction to Rol Edition J. J. Craig Robot Modeling and M. W. Spong, S. Hutchinson, M. Vidyasagar	Publisher Control Publisher	Prentice Hall John Wiley &	Publish year ISBN	
3-3. Static forces in Self Preparation and Read the handouts I Related subjects Fundamentals of line Notes for textbook Handouts will be pre Reference1 Reference2 Notes for reference N/A Goals to be achieve Be able to derive kin Evaluation of achieve Grade will be determ	a manipulators. d Review before the lecture. ear algebra and me spared. Book title Author Book title Author d nematics of robotion rement	Introduction to Rol Edition J. J. Craig Robot Modeling and M. W. Spong, S. Hutchinson, M. Vidyasagar	Publisher Control Publisher	Prentice Hall John Wiley &	Publish year ISBN	
3-3. Static forces in Self Preparation and Read the handouts I Related subjects Fundamentals of line Notes for textbook Handouts will be pre Reference1 Reference2 Notes for reference N/A Goals to be achieve Be able to derive kin Evaluation of achieve	a manipulators. d Review before the lecture. ear algebra and me spared. Book title Author Book title Author d nematics of robotic rement nined only from the	echanics. Introduction to Rol Edition J. J. Craig Robot Modeling and M. W. Spong, S. Hutchinson, M. Vidyasagar	Publisher Control Publisher	Prentice Hall John Wiley &	Publish year ISBN	
3-3. Static forces in Self Preparation and Read the handouts I Related subjects Fundamentals of line Notes for textbook Handouts will be pre Reference1 Reference2 Notes for reference N/A Goals to be achieve Be able to derive kin Evaluation of achieve Grade will be determ Examination 定期試験を実施(対 Examination(Face to	a manipulators. d Review before the lecture. ear algebra and me spared. Book title Author Book title Author d nematics of robotic rement nined only from the D Face)	echanics. Introduction to Rol Edition J. J. Craig Robot Modeling and M. W. Spong, S. Hutchinson, M. Vidyasagar	Publisher Control Publisher	Prentice Hall John Wiley &	Publish year ISBN	
3-3. Static forces in Self Preparation and Read the handouts I Related subjects Fundamentals of line Notes for textbook Handouts will be pre Reference1 Reference2 Notes for reference N/A Goals to be achieve Be able to derive kin Evaluation of achieve Grade will be detern Examination 定期試験を実施(対 Examination(Face to Details of examinati	d Review before the lecture. ear algebra and me spared. Book title Author Book title Author d nematics of robotic rement nined only from the b Face) on	echanics. Introduction to Rol Edition J. J. Craig Robot Modeling and M. W. Spong, S. Hutchinson, M. Vidyasagar	Publisher Control Publisher	Prentice Hall John Wiley & Sons	Publish year ISBN	

The credit of this course is given if the score of the above examination is 60% or over. Grade levels are C (60% - less than 70%), B (70 - less than 80%), A (80 - less than 90%) and S (90% or over). Other information Office: Room D-406, E-mail uchiyama@tut.jp Reference URL N/A Office hours Contact the lecturer by e-mail first. Relations to attainment objectives of learning and education 機械工学専攻 (C1)機械工学志よびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。 Graduate Program of Mechanical Engineering for Master's Degree (C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineering and related fields; and to utilize such knowledge in an integrated manner Key words

Manipulator, Kinematics, Coordinate Transformation

(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 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.To understand water/oil hammer
5.To understand recent topics of fluid power systems
Evaluation of achievement
レポート(50 点), 試験(50 点)の割合で成績を評価する。
得点によって達成の程度を以下のように明示する。
評価 S:90 点以上
評価 A:80~89 点
評価 B:70~79 点
評価 C:60~69 点
Each student's achievement is evaluated by the sum of examination (50%) and
reports (50%).
Students will be evaluated as follows:
S: Obtained total points of exam and reports, 90 or higher (out of 100 points).
A: Obtained total points of exam and reports, 80 or higher (out of 100 points).
B: Obtained total points of exam and reports, 70 or higher (out of 100 points). C: Obtained total points of exam and reports, 60 or higher (out of 100 points).
C. Obtained total points of exam and reports, of or higher (out of 100 points).
Examination
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
居室:D−309, 電話:44−6668, e−mail:yanada@me.tut.ac.jp
Office:D-309, Tel:44-6668, e-mail:yanada@me.tut.ac.jp
Reference URL
特になし
N/A
Office hours
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)高度な知識を統合的に活用できる実践力・創造力
機械工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践的・創造的能
力を身につけている。
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize
such knowledge forproblem solving in an integrated manner Key words
Ney 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

(M41630463)Advances in Systems, Control and Robotics[Advances in Systems, Control and Robotics]

Subject	Advances in	Systems, Control ar	nd Robotics Advance	es in Systems Cor	trol and Roboti	cs]
name[English]		Cystems, Control al		os in Gysteins, OOI		001
Schedule number	M41630463		Subject area	Advanced	Required or	Elective
	-			Mechanical	elective	
				Engineering		
Time of starting a	Fall2+Spring	1	Day of the	Tue.2~2	Credit(s)	2
course			week,period			
Faculty	Graduate Pro	ogram for Master's D	Degree		Subject	2~
					grade	
Department Offered	Mechanical E	Ingineering			Beggining grade	M1
Charge teacher	章 忠,内山	直樹 SHO Tadashi	UCHIYAMA Naoki			
name[Roman						
alphabet mark]						
Numbering	MEC_MAS55	025				
Objectives of class						
To learn fundamentals enterprises.	of mathema	atical programming	that is typically e	employed for the	management o	f industries and
Contents of class						
First half:						
1. Basic theory of time-	-frequency and	alysis method will be	briefly discussed.			
1)Shot-Time Fourier tra			-			
2)The Wigner-Ville Distr	ribution					
3)Hilbert Transform and	l instantaneou	s frequency analysis				
4)Wavelet transform						
2.Application of the wav	elet Transfor	m will be briefly disc	ussed.			
1) Time series signal an	alysis					
2) Image processing						
3) Abnormal detection						
4) Surface inspection						
Last half:						
1st week: Fundamentals	of mathemat	ical programming				
2nd week: Fundamentals	s of linear pro	gramming				
3rd week: Simplex algori						
4th week: Simplex algori						
5th week: Fundamentals		programming				
6th week: Gradient meth		ulI				
7th week: Quadratic inte	•					
8th week: Summary and	i iiriai examina					
	eview					
•						
Self Preparation and Re Required to prepare for		ach lecture contents	based on handout	S.		
Required to prepare for Related subjects	and review ea		based on handout	S.		
Required to prepare for Related subjects	and review ea		based on handout	S		
Required to prepare for Related subjects Basic knowledge of the Calculus and Linear alge	and review ea		based on handout	S.		
Required to prepare for Related subjects Basic knowledge of the	and review ea		based on handout	S		
Required to prepare for Related subjects Basic knowledge of the Calculus and Linear alge	and review ea signal analysis ebra	S	based on handout	S		

	Author	Y. Shimizu , Z.	Publisher	Springer	Publish	2007
		Zhang, R. Batres		op80.	year	
Reference2	Book title	Wavelets and analys	is		ISBN	
	Author	M. Holschneider	Publisher	Oxford	Publish	
				University Press	year	
Reference3	Book title	Time-Frequency Ana	alysis	•	ISBN	
	Author	R.L. Allen, D.W. Mills	Publisher	IEEE Press	Publish year	
Reference4	Book title	Schaum's Outline of	Operations Re	search 2nd Edition	ISBN	978- 0070080201
	Author	Richard Bronson	Publisher	McGraw-Hill Education	Publish year	1997
Notes for reference	•	L		- 1	1.	
N/A						
Goals to be achieve	d					
Expected to underst	and the theory o	s of mathematical prog f the simplex method. s of nonlinear program				
Evaluation of achiev	ement					
First half: Interim rep	port (50%) and te	rm-end report (50%)				
Last half: The grade will be de	termined by the o	end-of-term examinati	on score only (100 %).		
	-	ne score of the above 5%), B (65 – less than				
Examination		., .		·		
その他						
Other						
Details of examination	on					
First half: Report						
Last half: End-of-te	rm examination					
Other information						
Room: D−610, E−mai	il: zhang@me.tut.a	ic.jp				
E−mail: uchiyama@m	e.tut.ac.jp					
Reference URL						
http://is.me.tut.ac.jp	1					
Office hours						
Contact the lecturer		learning and educatio	n			
(C)高度な知識を統 機械工学およびその 力を身につけている	関連分野に関す	る実践力・創造力 る高度な知識を修得し	, それらを課題	解決のために統合的	りに活用できる	5実践的·創造的能
Have advanced know such knowledge forp	wledge about me	lize advanced knowled chanical engineering a an integrated manner	nd related field		tical and crea	tive skills to utilize
Key words						
Wavelet transform, 1	lime−frequency a	nalysis, Mathematical	Programming, L	inear Programming,	Nonlinear Pro	gramming

(M41630470)Microstructural Control of Metallic Materials[Microstructural Control of Metallic Materials]

Subject name[English]	Microstructural C	ontrol of Met	tallic M	aterials[Microstruc	tural Control of Met	allic Materials]
Schedule number	M41630470	Subject ar	ea	Advanced	Required or	Elective
				Mechanical	elective	
				Engineering		
Time of starting a course	Fall2 term	Day of	the	Thu.2~2	Credit(s)	1
		week,perio				
Faculty	Graduate Program	n for Master'	s Degre	ee	Subject grade	1~1
Department Offered	Mechanical Engine	eering			Beggining	M1
					grade	
Charge teacher name[Roman	三浦 博己 MIUR	A Hiromi				
alphabet mark]						
Numbering	MEC_MAS54025					
Objectives of class						
N/A						
Learn about newest strengthenin	g mechanisms of me	etallıc materı	als and	microstructural co	ontrol for strengther	ning.
Contents of class						
N/A 1. Cuidence and metallic metavial	-					
 Guidance and metallic material Grain-boundary energy and dis 						
 Grain-boundary energy and dis Grain-boundary energy and me 						
4. Static recrystallization and mic						
5. Dynamic recrystallization and r						
Self Preparation and Review						
N/A						
Basic knowledge about metallic m	naterials is mandato	rv				
Related subjects		.,				
N/A						
N/A						
Notes for textbook						
N/A						
Text will be provided						
Notes for reference						
N/A						
N/S						
Goals to be achieved						
N/A						
To know newest topics on micros	structural control fo	r strengthen	ing of r	netallic materials		
Evaluation of achievement						
N/A						
Reports after classes are require Examination	d for evaluation inst	tead of exam	ination			
レポートで実施						
D小一下C 実施 By Report						
Details of examination						
N/A						
N/A						
Other information						
N/A						
N/A						
Reference URL						
N/A						
N/A						
Office hours						
N/A						
After classes						
Relations to attainment objective	s of learning and e	ducation				
N/A						
機械工学専攻						

(C)高度な知識を統合的に活用できる実践力・創造力 機械工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践的・創造的能 力を身につけている。

To know newest topics on microstructural control of metallic materials

Graduate Program of Mechanical Engineering for Master's Degree

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge forproblem solving in an integrated manner

Key words

N/A Microstructural control

(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 E	lectronic Informat	on Engineering[The	esis Research o
		ectronic Information	_		
Schedule number	M42610020	Subject area	Advanced Electrical and Electronic Information	Required or elective	Required
Time of starting a course	2Years	Day of the	Engineering Intensive	Credit(s)	6
Faculty	Graduate Progra	week,period m for Master's Degre		Subject grade	1~1
Department Offered	_	ectronic Information		Beggining	M1
			5 5	grade	
Charge teacher name[Roman alphabet mark]	S2系教務委員,	2系各教員 2kei kyoi	mu Iin−S, 2kei kakuł	youin	
Numbering	ELC_MAS51025				
Objectives of class	_				
The thesis research aims to pro understanding of the electrical ar Contents of class The research subject depends o research subject. For more detail	nd electronic inform n the supervisor a	nation engineering. nd the research gro			
Self Preparation and Review					
Related subjects					
Notes for textbook					
Reference and material will be av	ailable from the su	pervisor.			
Notes for reference					
Goals to be achieved					
To get something new on individu	al research fields.				
To develop his/her research skill	including the planr	ning and the present	ation.		
Evaluation of achievement					
Presentation, Thesis, Coursework	k, and Outcomes ar	re evaluated generall	у.		
Grades: S: 90-100, A:80-89, B:70	-79, C:60-69				
Examination					
試験期間中には何も行わない					
None during exam period					
Details of examination					
Other information					
Other information					
Other information Reference URL Office hours	se of learning and	ducation			
Other information Reference URL Office hours	es of learning and e	oducation			
Other information Reference URL	-		researchers		
Other information Reference URL Office hours Relations to attainment objective (B) Sound ethics and social awar	eness as advanced	-level engineers and		researchers; have t	the ability to se
Other information Reference URL Office hours Relations to attainment objective	eness as advanced ethical responsibil	-level engineers and		researchers; have t	the ability to se

Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about electrical and electronic information engineering as well as related fields; to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about electrical and electronic information engineering as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

(D) Communication skills for global success

Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members

(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

(D2) Have high-level skills to mutually respect the values of individual team members; to contribute to the team's achievements through working cooperatively with other members

(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

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

Electronic Information Engineeri	-			- · · · ·	
Subject name[English]		h on Electrical and E	-	ion Engineering[Th	esis Research on
Ochodala and I		ectronic Information		Den 1	D
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 Progra	am for Master's Degre	e	Subject grade	1~
Department Offered	Electrical and El	ectronic Information	Engineering	Beggining grade	M1, M2
Charge teacher name[Roman	S2系教務委員	2系各教員 2kei kyo	mu lin−S. 2kei kakuk		
alphabet mark]				(j = 0.111	
Numbering	ELC_MAS51025				
	220_11/1001020				
Objectives of class	vido o prostinal	unarianaa of uses	work and to a	ura hia/har raasar	مه مادال ساعه م
The thesis research aims to pro		-	i work, and to acqu	lire his/her researd	ch skill with deep
understanding of the electrical ar	iu electronic infori	nation engineering.			
Contents of class					
The research subject depends o	•		up you belong to. E	every student will h	nave an individual
research subject. For more detail	s, please contact	with your supervisor.			
Self Preparation and Review					
N/A					
Related subjects					
N/A					
Notes for textbook					
Reference and material will be av	ailable from the su	upervisor.			
Notes for reference					
N/A					
Goals to be achieved					
To get something new on individu	al research fields				
To develop his/her research skill			ation		
Evaluation of achievement					
Presentation, Thesis, Coursework	and Outcomes a	re evaluated general	M		
Grades: S: 90–100, A:80–89, B:70		ire evaluated generali	у.		
Examination	, 0, 0.00 00				
試験期間中には何も行わない					
None during exam period					
Details of examination					
N/A					
Other information					
N/A					
Reference URL					
N/A					
Office hours					
N/A	<u>.</u>	•			
Relations to attainment objective	es of learning and	education			
(B)技術者・研究者としての正しし	い倫理観と社会性				
上級技術者・研究者として社会的			術的課題を設定・	解決・評価する能力	hを身につけてい
	」 Ш 4 王 4 7 頁 [1 で 1			⋽ ⊤ /∕∖ п⊤ IШ Ϡ ′Q flC /	
	できるまませ ううば	= + 1			
 (C)高度な知識を統合的に活用 電気・電子情報工学およびその 			てわこす無時から	のためになるやい	- 江田太七7 中叶
		局度な知識を修守し	、てれらを誄越辨け	のために統合的	- 活用できる夫岐
的・創造的能力を身につけている	0				

(D)グローバルに活躍できるコミュニケーションカ

グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で、自らの考えや成果を効果的に表現するコミュニケーションカを身につけている。

(E)最新の技術や社会環境の変化に対する探究心と持続的学習力

社会,環境,技術等の変化に対応して,生涯にわたって自発的に計画し学習する能力を身につけている。

(B) Sound ethics and social awareness as advanced-level engineers and researchers

Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technical issues in society

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about electrical and electronic information engineering as well as related fields; to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about electrical and electronic information engineering as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

(D) Communication skills for global success

Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members

(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

(D2) Have high-level skills to mutually respect the values of individual team members; to contribute to the team's achievements through working cooperatively with other members

(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

(B) Sound ethics and social awareness as advanced-level engineers and researchers

Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technicalissues in society

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills toutilize such knowledge for problem solving in an integrated manner

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(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

(M4261002T)Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]

Subject name[English]	Thesis Researc	h on Electrical and E	lectronic Informat	ion Engineering[Th	esis Research or
	Electrical and E	lectronic Information	Engineering]		
Schedule number	M4261002T	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Progra	am for Master's Degre	e	Subject grade	2~
Department Offered	Electrical and E	lectronic Information	Engineering	Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S2系教務委員,	2系各教員 2kei kyor	mu Iin−S, 2kei kakuł	kyouin	
Numbering	ELC MAS51025				
Objectives of class					
The thesis research aims to prov	vide a practical e	vnerience of research	work and to acqu	uire his/her resear	ch skill with dee
understanding of the electrical an	-		i work, and to acqu		
Contents of class					
	the supervisor	and the recearch are	un vou belong to E	very student will h	ave an individur
The research subject depends of			up you belong to. E	every student will r	have an individua
research subject. For more detail	s, please contact	with your supervisor.			
Self Preparation and Review					
N/A					
Related subjects					
N/A					
Notes for textbook					
Reference and material will be av	ailable from the s	upervisor.			
Notes for reference					
N/A					
Goals to be achieved					
To get something new on individu					
To develop his/her research skill	including the plan	ning and the presenta	ation.		
Evaluation of achievement					
Presentation, Thesis, Coursework		are evaluated generall	у.		
<u>Grades: S: 90–100, A:80–89, B:70</u>	-79, C:60-69				
試験期間中には何も行わない					
None during exam period					
Details of examination					
N/A					
Other information					
N/A Defense LIDI					
N/AA					
N/A Relations to attainment objective		- d			
(B)技術者・研究者としての正しし 上級技術者・研究者として社会的 る。	い倫理観と社会性 か・倫理的責任を?	有し, 社会における技	術的課題を設定・ウ	解決・評価する能け	りを身につけてい
(C)高度な知識を統合的に活用す 電気・電子情報工学およびその 的・創造的能力を身につけている	関連分野に関する		,それらを課題解決	そのために統合的に	こ活用できる実践
的・創造的能力を身につけている (C1)電気・電子情報工学および・	-	1論・応田知識を白発)	的に獲得 チャム	を統合的に注田で	きろ能力を身に~
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けている。

(C2) 電気・電子情報工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得して、研究開発の計画を立案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。

(D)グローバルに活躍できるコミュニケーションカ

グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で、自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。

(D1) 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・発信し, コミュニケーションする能力を身につけている。

(D2) チーム内の個々の要員の価値観を互いに尊重するとともに、協調して、チームとしての目標達成に寄与できる高い能力を 身につけている。

(E)最新の技術や社会環境の変化に対する探究心と持続的学習力

社会,環境,技術等の変化に対応して,生涯にわたって自発的に計画し学習する能力を身につけている。

(B) Sound ethics and social awareness as advanced-level engineers and researchers

Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technical issues in society

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

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(D2) Have high-level skills to mutually respect the values of individual team members; to contribute to the team's achievements through working cooperatively with other members

(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

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(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

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

Engineering					
Subject name[English]		ectrical and Electroni	c Information Eng	gineering[Seminar o	on Electrical an
		rmation Engineering]			ſ
Schedule number	M42610040	Subject area	Advanced	Required or	Required
			Electrical and	elective	
			Electronic		
			Information		
			Engineering		
Time of starting a course	Year	Day of the	Intensive	Credit(s)	6
Faculty	Graduata Dua	week,period		Cubic at and de	2~
Faculty Department Offered	-	am for Master's Degre lectronic Information		Subject grade Beggining	2~ M2
			Lingineering	grade	1012
Charge teacher name[Roman	S2系教務委員	2kei kyomu Iin-S		grado	
alphabet mark]					
Numbering	ELC_MAS51015	i			
Objectives of class					
The seminar aims to provide a b	oroad understandi	ng of theoretical and	experimental appro	oches related to t	he electrical an
electronic information engineerin		-			
Contents of class					
The class provides both of funda	mental knowledge	on the research work	of master thesis a	nd the most advan	ced results in th
related field by reading research	-				
individual supervisors.		Beneficial Soliconto of th			
Self Preparation and Review					
N/A					
Related subjects					
·····					
N/A					
N/A Notes for textbook					
Notes for textbook	e available from th	ne supervisor. To be a	nnounced by individ	ual supervisors	
	e available from th	ne supervisor. To be a	nnounced by individ	lual supervisors.	
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Notes for textbook Textbook or material will be made Notes for reference N/A Goals to be achieved To acquire fundamental knowledg To acquire the ability of finding a Evaluation of achievement Coursework, presentation and/or Grades: S: 90-100, A:80-89, B:70 Examination 試験期間中には何も行わない None during exam period Details of examination N/A Other information N/A Reference URL N/A Office hours N/A	e on individual re problem, the abili report. 79, C:60-69	search fields. ty of solving the prob			
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Notes for textbook Textbook or material will be made Notes for reference N/A Goals to be achieved To acquire fundamental knowledg To acquire the ability of finding a Evaluation of achievement Coursework, presentation and/or Grades: S: 90-100, A:80-89, B:70 Examination 試験期間中には何も行わない None during exam period Details of examination N/A Other information N/A Reference URL N/A Office hours N/A Relations to attainment objective	e on individual re problem, the abili report. 79, C:60-69	search fields. ty of solving the prob			
Notes for textbook Textbook or material will be made Notes for reference N/A Goals to be achieved To acquire fundamental knowledg To acquire the ability of finding a Evaluation of achievement Coursework, presentation and/or Grades: S: 90-100, A:80-89, B:70 Examination 試験期間中には何も行わない None during exam period Details of examination N/A Other information N/A Reference URL N/A Office hours N/A Relations to attainment objective (B)技術者・研究者としての正し	ge on individual re problem, the abili report. -79, C:60-69 	search fields. ty of solving the prob	lem and the present	ation skill.	コを身につけて!
Notes for textbook Textbook or material will be made Notes for reference N/A Goals to be achieved To acquire fundamental knowledg To acquire the ability of finding a Evaluation of achievement Coursework, presentation and/or Grades: S: 90-100, A:80-89, B:70 Examination 試験期間中には何も行わない None during exam period Details of examination N/A Other information N/A Reference URL N/A Office hours N/A Relations to attainment objective (B)技術者・研究者としての正し 上級技術者・研究者として社会的	ge on individual re problem, the abili report. -79, C:60-69 	search fields. ty of solving the prob	lem and the present	ation skill.	」を身につけてし
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的・創造的能力を身につけている。

(C1) 電気・電子情報工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。

(C2) 電気・電子情報工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得して、研究開発の計画を立案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。

(D)グローバルに活躍できるコミュニケーションカ

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(B) Sound ethics and social awareness as advanced-level engineers and researchers

Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technical issues in society

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

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Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

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

Subject name[English]	Seminar on Elec	trical and Electronic	Information Engine	eering 1A[Seminar	on Electrical ar		
	Electronic Inform	ronic Information Engineering 1A]					
Schedule number	M42610050 Subject area		Advanced Electrical and Electronic Information Engineering	Required or elective	Required		
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	4		
Faculty	Graduate Progra	m for Master's Degre	e	Subject grade	1~		
Department Offered	Electrical and Ele	ectronic Information	Beggining grade	M1			
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S						
Numbering	ELC_MAS51015						
Objectives of class							
The seminar aims to provide a b	road understandin	g of theoretical and	experimental appro	aches related to t	he electrical ar		
electronic information engineering	for the research	_ work of his∕her mast	er thesis.				
Contents of class							
The class provides both of fundan	nental knowledge	on the research work	of master thesis a	nd the most advan	ced results in th		
related field by reading research p							
individual supervisors.							
Self Preparation and Review							
Related subjects							
N/A							
Notes for textbook							
	available from the	aunomioca Taka -					
Textbook or material will be made	available from the	e supervisor. To be a	intouricea by individ	ual supervisors.			
Notes for reference							
N/A							
Goals to be achieved							
To acquire fundamental knowledge							
To acquire the ability of finding a	problem, the abilit	y of solving the prob	lem and the present	ation skill.			
Evaluation of achievement							
Coursework, presentation and/or							
Grades: S: 90-100, A:80-89, B:70-	-79, C:60–69						
Examination							
試験期間中には何も行わない							
None during exam period							
Details of examination							
Dorails of Oxallingation							
N/A							
N/A Other information							
N/A Other information N/A							
N/A Other information N/A Reference URL							
N/A Other information N/A Reference URL N/A							
N/A Other information N/A Reference URL N/A Office hours							
N/A Other information N/A Reference URL N/A Office hours N/A	s of learning and o	aducation					
N/A Other information N/A Reference URL N/A Office hours N/A Relations to attainment objective (B)技術者・研究者としての正しい	倫理観と社会性		術的課題を設定・6	解決・評価する能り	1を身につけて!		
N/A Other information N/A Reference URL N/A Office hours N/A Relations to attainment objective	ー倫理観と社会性 ・倫理的責任を有 きる実践力・創造	īし, 社会における技 カ					

けている。

(C2) 電気・電子情報工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得して、研究開発の計画を立案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。

(D)グローバルに活躍できるコミュニケーションカ

グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で、自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。

(D1) 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・発信し, コミュニケーションする能力を身につけている。

(D2) チーム内の個々の要員の価値観を互いに尊重するとともに、協調して、チームとしての目標達成に寄与できる高い能力を 身につけている。

(E)最新の技術や社会環境の変化に対する探究心と持続的学習力

社会,環境,技術等の変化に対応して,生涯にわたって自発的に計画し学習する能力を身につけている。

(B) Sound ethics and social awareness as advanced-level engineers and researchers

Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technical issues in society

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about electrical and electronic information engineering as well as related fields; to utilize such knowledge in an integrated manner

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(D) Communication skills for global success

Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members

(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

(D2) Have high-level skills to mutually respect the values of individual team members; to contribute to the team's achievements through working cooperatively with other members

(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

(B) Sound ethics and social awareness as advanced-level engineers and researchers

Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technicalissues in society

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(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

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

Information Engineering 1B]	Seminer Fl	twicel and Flasters	Information For		an Electrical -		
Subject name[English]		<ul> <li>Electrical and Electronic Information Engineering 1B[Semin Information Engineering 1B]</li> </ul>		eering IBLSeminar	on Electrical and		
Schedule number	M42610060 Subject area		Advanced Electrical and Electronic	Required or elective	Required		
			Information Engineering				
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	2		
Faculty	_	Graduate Program for Master's Degree         Subject grade         2~           Electrical and Electronic Information Engineering         Beggining         M2					
Department Offered		grade					
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin−S						
Numbering	ELC_MAS51015						
Objectives of class The seminar aims to provide a b electronic information engineering		-		ooches related to t	the electrical and		
<b>Contents of class</b> The class provides both of fundar related field by reading research							
individual supervisors. Self Preparation and Review							
N/A							
Related subjects							
N/A							
Notes for textbook							
Textbook or material will be made	e available from th	e supervisor. To be a	nnounced by individ	lual supervisors.			
			,	·			
Notes for reference							
N/A							
Goals to be achieved							
To acquire fundamental knowledg							
To acquire the ability of finding a	problem, the abilit	ty of solving the prob	lem and the present	tation skill.			
Evaluation of achievement							
Coursework, presentation and/or Grades: S: 90-100, A:80-89, B:70	•						
Examination 試験期間中には何も行わない							
None during exam period							
Details of examination							
N/A							
Other information							
N/A Reference URL							
N/A							
Office hours							
N/A Relations to attainment objective	es of learning and	education					
(B)技術者・研究者としての正しし	い倫理観と社会性						
上級技術者・研究者として社会的	り・倫理的責任をる	<b>肓し,社会における</b> 技	5術的課題を設定・1	解決・評価する能力	りを身につけてし		
る。							
る。 (℃)高度な知識を統合的に活用↑	できる実践力・創造	ī					

(C1) 電気・電子情報工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。

(C2) 電気・電子情報工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得して、研究開発の計画を立案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。
 (D)グローバルに活躍できるコミュニケーションカ

グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で、自らの考えや成果を効果的に表現するコミュニケーションカを身につけている。

(D1) 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・発信し, コミュニケーションする能力を身につけている。

(D2) チーム内の個々の要員の価値観を互いに尊重するとともに,協調して,チームとしての目標達成に寄与できる高い能力を 身につけている。

(E)最新の技術や社会環境の変化に対する探究心と持続的学習力

社会,環境,技術等の変化に対応して,生涯にわたって自発的に計画し学習する能力を身につけている。

(B) Sound ethics and social awareness as advanced-level engineers and researchers

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(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about electrical and electronic information engineering as well as related fields; to utilize such knowledge in an integrated manner

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Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

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(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment

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

(M42630100)Methodology of R &								
Subject name[English]	Methodology of R	& D 1[Methodology	of R & D 1]					
Schedule number	M42630100	Subject area	Advanced	Required or	Elective			
			Electrical and	elective				
			Electronic					
			Information					
			Engineering					
Time of starting a course	Fall term	Day of the	Tue.3~3	Credit(s)	2			
		week,period	140.0 0		-			
Faculty	Graduate Program	n for Master's Degre	6	Subject grade	1~			
Department Offered		ctronic Information		Beggining	M1			
	grade							
Charge teacher name[Roman	S2系教務委員 2	kei kvomu lin-S		giauo				
alphabet mark]	52宋我初女員 2							
•		ELC MAS58025						
Numbering	ELC_MAS58025							
Objectives of class								
The class aims to provide a bas	sic understanding	of R&D methodolog	y related to the e	lectrical and elect	ronic information			
engineering for the research work	of his/her master	thesis.						
Contents of class								
The class provides some fundame	ental tips to condu	ict R&D work effect	ively. Contents of t	he class depend o	n the supervisor			
To be announced by individual sur		iot hab work encou	ivery. Contents of t					
0.00								
Self Preparation and Review								
N/A								
Related subjects								
N/A								
Notes for textbook								
Reference and material will be ava	ailable from the sup	pervisor.						
Notes for reference								
N/A								
Goals to be achieved								
To acquire the ability of identify	ing and formulativ	ng research problen	n. planning and imp	plementing specific	research tasks.			
troubleshooting and communicatin	-			0.1				
Evaluation of achievement	0							
Coursework and presentation are	evaluated generally	<i>.</i>						
Grades: S: 90–100, A:80–89, B:70-		,.						
Examination	70, 0.00 00							
試験期間中には何も行わない								
None during exam period Details of examination								
N/A								
Other information								
N/A								
Reference URL								
Reference URL N/A								
Reference URL								
Reference URL N/A								
Reference URL N/A Office hours	s of learning and e	ducation						
Reference URL N/A Office hours N/A	s of learning and e	ducation						
Reference URL N/A Office hours N/A	s of learning and e	ducation						
Reference URL N/A Office hours N/A Relations to attainment objective	-							
Reference URL N/A Office hours N/A Relations to attainment objective (C)高度な知識を統合的に活用で	きる実践力・創造	Ъ						
Reference URL N/A Office hours N/A Relations to attainment objective (C)高度な知識を統合的に活用で 電気・電子情報工学およびその員	きる実践力・創造: 見連分野に関する	Ъ	, それらを課題解決	そのために統合的に	こ活用できる実践			
Reference URL         N/A         Office hours         N/A         Relations to attainment objective         (C)高度な知識を統合的に活用で         電気・電子情報工学およびその関助・創造的能力を身につけている。	きる実践力・創造 見連分野に関する 調	力 高度な知識を修得し						
Reference URL         N/A         Office hours         N/A         Relations to attainment objective         (C)高度な知識を統合的に活用で         電気・電子情報工学およびその関約・創造的能力を身につけている。         (C1)電気・電子情報工学およびその	きる実践力・創造 見連分野に関する 調	力 高度な知識を修得し						
Reference URL         N/A         Office hours         N/A         Relations to attainment objective         (C)高度な知識を統合的に活用で         電気・電子情報工学およびその関約・創造的能力を身につけている。         (C1)電気・電子情報工学およびその目         けている。	きる実践力・創造 調連分野に関する 。 その関連分野の理論	力 高度な知識を修得し 侖・応用知識を自発的	的に獲得し、それら	を統合的に活用でき	きる能力を身につ			
Reference URL         N/A         Office hours         N/A         Relations to attainment objective         (C)高度な知識を統合的に活用で         電気・電子情報工学およびその関約・創造的能力を身につけている。         (C1)電気・電子情報工学およびその	きる実践力・創造 調連分野に関する 。 その関連分野の理論	力 高度な知識を修得し 侖・応用知識を自発的	的に獲得し、それら	を統合的に活用でき	きる能力を身につ			
Reference URL         N/A         Office hours         N/A         Relations to attainment objective         (C)高度な知識を統合的に活用で         電気・電子情報工学およびその関約・創造的能力を身につけている。         (C1)電気・電子情報工学およびその目         けている。	きる実践力・創造 調連分野に関する語 その関連分野の理論 その関連分野の広	力 高度な知識を修得し 論・応用知識を自発的 範囲の知識の連携(	的に獲得し,それらる	を統合的に活用でき	きる能力を身につ			

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

Subject name[English]	Material Science	for Electronics 2[Ma	terial Science for E	lectronics 2]		
Schedule number	M42630130	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Elective	
Time of starting a course	Fall term	Day of the week,period	Mon.5~5	Credit(s)	2	
Faculty	Graduate Progran	n for Master's Degre	e	Subject grade	1~	
Department Offered	Electrical and Ele	ctronic Information	Engineering	Beggining grade	M1	
Charge teacher name[Roman alphabet mark]	内田 裕久,中村	雄一, 河村 剛 UC	HIDA Hironaga, NAk	AMURA Yuichi, KA	AWAMURA Go	
Numbering	ELC MAS52025					
Objectives of class						
Objective of this subject is to plasmonics and optoelectronics. Objective of this subject is to plasmonics and optoelectronics. <b>Contents of class</b>						
1. Spin electronics						
You will learn about materials and 1) magnetic materials, 2) magneto						
<ul> <li>thermodynamics and transport ph</li> <li>1) thermodynamics and materials</li> <li>3. Plasmonics and optoelectronic</li> <li>You will learn about materials use</li> <li>1) fundamentals of surface plasm</li> </ul>	processing, 2) fund s ed in plasmonics and	d optoelectronic dev	ices.			
<ol> <li>Spin electronics</li> <li>You will learn about materials and</li> <li>magnetic materials, 2) magneto</li> </ol>						
<ul><li>2. Thermoelectronics</li><li>You will learn about advanced thermodynamics and transport ph</li><li>1) thermodynamics and materials</li></ul>	nenomena.			stric energy conv	ersion based or	
<ul><li>3. Plasmonics and optoelectronic</li><li>You will learn about materials use</li><li>1) fundamentals of surface plasm</li></ul>	ed in plasmonics and	-				
You will learn about materials use	ed in plasmonics and	-				
You will learn about materials use 1) fundamentals of surface plasm	ed in plasmonics and	-				
You will learn about materials use 1) fundamentals of surface plasm Self Preparation and Review Related subjects Notes for textbook	ed in plasmonics and on resonance, 2) Ad	-				
You will learn about materials use 1) fundamentals of surface plasm Self Preparation and Review Related subjects Notes for textbook Lecture materials will be distribut	ed in plasmonics and on resonance, 2) Ad	-				
You will learn about materials use 1) fundamentals of surface plasm Self Preparation and Review Related subjects Notes for textbook	ed in plasmonics and on resonance, 2) Ad	-				
You will learn about materials use 1) fundamentals of surface plasm Self Preparation and Review Related subjects Notes for textbook Lecture materials will be distribut Lecture materials will be distribut	ed in plasmonics and on resonance, 2) Ad	-				

evelopment in various fields.
aims at acquiring the broad knowledge of research and development by learning about the bases of recent research and
evelopment in various fields.
valuation of achievement
he reports or tests will be set in each categories.
he result is evaluated from the sum of those marks.
rades: S:90-100, A:80-89, B:70-79, C:60-69.
ne reports or tests will be set in each categories.
he result is evaluated from the sum of those marks.
rades: S:90-100, A:80-89, B:70-79, C:60-69.
xamination
験期間中には何も行わない
one during exam period
etails of examination
ther information
pin electronics: Hironaga Uchida: uchida@ee.tut.ac.jp
hermoelectronics: Yuichi Nakamura: nakamura@ee.tut.ac.jp
lasmonics and optoelectronics: Go Kawamura: gokawamura@ee.tut.ac.jp
eference URL
ffice hours
lease make an appointment via e-mail.
lease make an appointment via e-mail.
elations to attainment objectives of learning and education
C)高度な知識を統合的に活用できる実践力・創造力 覚気・電子情報工学およびその関連分野に関する高度な知識を修得し, それらを課題解決のために統合的に活用できる実践 J・創造的能力を身につけている。
Practical and creative skills to utilize advanced knowledge in an integrated manner ave advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical nd creative skills toutilize such knowledge for problem solving in an integrated manner
ey words
in electronics, thermelectronics, plasmonics and optoelectronics
oin electronics, thermelectronics, plasmonics and optoelectronics

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

Subject name[English]	Electrical Energy S	Electrical Energy Systems 2[Electrical Energy Systems 2]						
Schedule number	M42630170	Subject	area		Advanced Electrical Electronic Information Engineering	and	Required o elective	<b>r</b> Elective
Time of starting a course	Fall term	Day week,pe		the	Mon.4~4		Credit(s)	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]	滝川 浩史,櫻井	庸司, 穂	積値	≦裕 T	AKIKAWA Hir	ofumi,	SAKURAI Yoji,	HOZUMI Naohiro
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.

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### **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

botano or oxaminación

## 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 Physics 2[Semiconductor Physics 2]						
Subject name[English]					De muine d	Elective	
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,peric					
Faculty		Graduate Program for Master's Degree			Subject grade	1~	
Department Offered	Electrical and Ele	ctronic Infor	mation	Engineering	Beggining	M1	
	*********		17 mil	1	grade		
Charge teacher name[Roman						OKADA Hiroshi,	
alphabet mark]	KAWANO Takeshi, TAKAHASHI Kazuhiro						
Numbering	ELC_MAS54025	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	造、設計や伯	乍製プロ	コセスを理解すること	を目標とする。		
To understand semiconductor phy	vsics, structure, de	sign, and pro	cessing	g of advanced semic	onductor devices.		
Contents of class		5 / T		, 			
この科目は前半と後半の2つの部	3分から構成される	前坐でけ n	n 接合	や MOS 構造におけ	る多数お上び小数	キャリアの振る舞	
いについて扱う。注入された少数							
	4 (1) (0) (1) 2		- 0/1±1		1.121.1201.201.	レノノハを送れる	
る。							
1. ナノ構造デバイスの作製およひ							
2. バンドエンジニアリングと量子交	カ果デバイス(若原)	1					
3. 先端 MEMS/NEMS 技術(河野,	高橋)						
講義に加えて学生が主体的に取	こ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についての調査研究や、要求を満足						
	「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。						
	rts. The first half begins by introducing majority- and minority-carrier behavior in fundamental						
			-		-		
pn-junction and MOS structures		carrier dyn	amics	n semiconductors	is also included. O	n the latter hair,	
student choose one from followin	collowing topics.						
1. Fabrication and characterizatio	Fabrication and characterization technology for Nanosturecture devices (Prof. Okada)						
2. Band engineering and quantum	ntum effect devices (Prof. Wakahara)						
3. Advanced MEMS/NEMS technol	ologies(Prof. Kawan	o, Prof. Taka	ahashi)				
Adding to lectures by professors	s in this subject a	a case stud	/is_als	o conducted Name	alv students are re	equired to give a	
presentation on researches on th	-				-		
presentation on researches on an	e given copies, and	on design of	uevice	5 (112) 32(3)(5) (5) (6)			
Self Preparation and Review							
特になし							
N/A							
Related subjects							
solid-state physics, basic of semi	conductor physics,	quantum me	echanic	s, thermodynamics,	and electronics		
solid-state physics, basic of semi	conductor physics,	quantum me	echanic	s, thermodynamics,	and electronics		
Notes for textbook							
S.M.Sze, Physics of Semiconduct	or Devices (Wiley)						
S.W.SZE, FRYSICS OF SEMICONDUCT	or Devices (wiley)						
関連する参考文献やデータ、資料		する。					
S.M.Sze, Physics of Semiconduct	or Devices (Wiley)						
Related references, data, printed	matters will be give	n in the clas	ss.				
Notes for reference	5						

特になし
N/A
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.
<ol> <li>Design a essential part of semiconductor devoie that satisfies the given specification.</li> <li>Investigate on given topics and give a leature on this</li> </ol>
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
特になし N/A
N/A 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
□□田浩:C=303B okada[at]ee.tut.ac.jp
河野剛士 : C-603 kawano[at]ee.tut.ac.jp
高橋一浩 : C−606 takahashi[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 Kazuhiro Takahashi:C-606 takahashi[at]ee.tut.ac.jp
Kazuniro Takanasni:U-ouo takanasni[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
メール等でアポイントを取ってください。
Take an appointment by e-mail.
Relations to attainment objectives of learning and education (C)高度な知識を統合的に活用できる実践力・創造力
(C)高度な知識を統合的に活用できる実践力・創造力 電気・電子情報工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践
電気電子情報工手6560での周辺分野に周外の周辺な知識を修存し、で10520k医府人のために配合助に沿所で2000kg 的・創造的能力を身につけている。
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical
and creative skills to utilize such knowledge for problem solving in an integrated manner

## 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	nic Info	rmatio	on Syst	tem 2[Advanced	d Ele	ctronic Inform	atior	n System 2]
Schedule number	M42630270	Subje	ct are	a	Advanced		Required	or	Elective
					Electrical a	nd	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	n for Ma	ster's	Degre	e		Subject grad	8	1~
Department Offered	Electrical and Elec	ctronic	Inform	nation	Engineering		Beggining		M1
							grade		
Charge teacher name[Roman	市川 周一,田村	昌也 IO	CHIKA	WA SI	nuichi, TAMURA	Mas	saya		
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 It is strongly recommended to prepare the lecture, e.g., to read the references before attending the corresponding lecture. The references will be shown by the lecturer whenever necessary. It is strongly recommended to prepare the lecture, e.g., to read the references before attending the corresponding lecture. The references will be shown by the lecturer whenever necessary. **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 (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 **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** 

(C)高度な知識を統合的に活用できる実践力・創造力

電気・電子情報工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践 的・創造的能力を身につけている。

(C1) 電気・電子情報工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。

(C2) 電気・電子情報工学およびその関連分野の広範囲の知識の連携により,研究開発に対する方法論を体得して,研究開発の計画を立案および実践し,課題解決のための新たな技術を創造できる能力を身につけている。

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills toutilize such knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about electrical and electronic information engineering as well as related fields; to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about electrical and electronic information engineering as well as related fields; to make plans for researchand development and put them into practice; and to create new technologies to solve problems

### 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 C Engineering I]	omputer Science an	d Engineering I[Se	eminar on Compu	ter Science
Schedule number	M43610010 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)	4
Faculty	Graduate Progr	am for Master's Degre	ee	Subject grade	1~
Department Offered	Computer Scie	nce and Engineering		Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S3系教務委員	3kei kyomu Iin−S		8.000	<u> </u>
Numbering	CMP_MAS5101	5			
技術情報を理解、説明、質疑・応: The course is intended for stud science and engineering. It is also aimed for students to a and technical discussion and writ	lents to study b	pasic materials in dep			
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. Notes for textbook 指導教員に問い合わせること。 Consult with your advisor.	₫・復習を行う。				
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	課釈でき、作文でき る。 そ指摘できる。 で指摘できる。 re on state-of-th tion written in Er	きる。 ne-art areas of expert iglish, and to write suc	-	-	
<ul> <li>(2) To interpret technical informa</li> <li>(3) To make a standard construct</li> <li>(4) To provide information by oral</li> <li>(5) To point out the lack of inform</li> </ul>	presentation.				
<ul><li>(2) To interpret technical informa</li><li>(3) To make a standard construct</li><li>(4) To provide information by oral</li></ul>	presentation.				
<ul><li>(2) To interpret technical informa</li><li>(3) To make a standard construct</li><li>(4) To provide information by oral</li></ul>	presentation. nation by questio	ns. 解度、説明の方法、智			

### 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

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about computer science and engineering as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as related fields; and to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about computer science and engineering as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

(M43610020)S πΓς **n**7

Subject name[English]	Seminar on Con Engineering II]	nputer Science and	d Engineering II[Se	eminar on Compu	ter Science an
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 Department Offered	_	n for Master's Degre e and Engineering	e	Subject grade Beggining grade	2~ M2
Charge teacher name[Roman alphabet mark]	S3系教務委員3	kei kyomu Iin−S			
Numbering	CMP_MAS61015				
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・ The course is intended for stuc science and engineering. It is also aimed for students to a and technical discussion and writ	答できる能力を養う dents to study bas acquire various skil	sic materials in dep	th, related to his/I	ner research subje	ects in compute
Related subjects 指導教員に問い合わせること。 Consult with your advisor. 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第           (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者           (5)情報の不足を質問という形式	解釈でき、作文できる る。 提供ができる。 で指摘できる。	5₀ −art areas of experti	· ·		
<ol> <li>To understand English literatu</li> <li>To interpret technical information</li> <li>To make a standard construct</li> <li>To provide information by ora</li> <li>To point out the lack of information</li> </ol>	tion of a technical p I presentation.	oaper.	n mormation in Eng	-	
<ul> <li>(2) To interpret technical informa</li> <li>(3) To make a standard construct</li> <li>(4) To provide information by ora</li> </ul>	tion of a technical p I presentation. nation by questions	baper.			から総合的に

Grade levels are S(90% or over), A(80%-less than 90%), B(70%-less than 80%) and C(60%-less than 70%) **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

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about computer science and engineering as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as related fields; and to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about computer science and engineering as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

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

Subject name[English]	Thesis Research on Computer Science and Engineering[Thesis Research on Computer							
	Science and Engi	-						
Schedule number	M43610030	Subject area	Advanced	Required or	Required			
			Computer	elective				
			Science and					
			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	1~1			
Department Offered	Computer Science	e and Engineering		Beggining	M1, M2			
				grade				
Charge teacher name[Roman alphabet mark]	S3系教務委員, 3	3系各教員 3kei kyor	mu Iin−S, 3kei kakuk	youin				
Numbering	CMP MAS61015							
-								
Objectives of class	ata ta faatau thaiu i	utovoto in vocovel			uning only and to			
The course is intended for studer		nterests in research	problems on comp	uter science and e	ingineering and to			
acquire ability for independent stu It is also simed for students to as		is research seens	ativonada a conco	f rooponoihility oh	ilition for problem			
It is also aimed for students to ac solving, research planning, decisio		-						
persistency, among others.	in making, outcome	presentation and s	abjeet investigation,		ien creativity and			
persistency, among others.								
Contents of class								
It is usually the case that thesis i	recearch is carried	out on individual ha	cas with specific co	ntanto diffaring fra	m one student to			
another.	esearch is carried		ses with specific co	intering intering into	in one student to			
Consult with your advisor for any	further details							
consult with your davisor for any								
Self Preparation and Review								
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								
Or als to be askinged								
Goals to be achieved	and develop	ment at technically	high lovel combine	instead desision was	line and loading			
To acquire abilities for doing res	search and develop	ment at technically	rligh level, sophist	icated decision ma	aking, and leading			
large scale research projects. Evaluation of achievement								
Three faculty members will be a	assigned to prepar	e the evaluation fo	r vour thesis rese	arch based on nu	blication records			
master thesis, and oral presentati			-	aron, bused on pu	biloution records,			
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	s of learning and e	ducation						

(D) Communication skills for global success

Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members

(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

(D2) Have high-level skills to mutually respect the values of individual team members; and to contribute to the team's achievements through working cooperatively with other team members

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

Subject name[English]	Thesis Research	Thesis Research on Computer Science and Engineering[Thesis Research on Computer									
	Science and Engir	neering]									
Schedule number	M43610030	Subje	ct are	a	Advanced		Required	or	Required		
				Computer		elective					
					Science	and					
					Engineering						
Time of starting a course	2Years	Day	of	the	Intensive		Credit(s)		6		
		week,	perioc	1							
Faculty	Graduate Program	n for Ma	ster's	Degre	e		Subject gra	de	1~		
Department Offered	Computer Science	e and E	nginee	ering			Beggining		M1, M2		
							grade				
Charge teacher name[Roman	S3系教務委員, 3	3系各教	[員 3k	ei kyoı	mu Iin−S, 3kei	i kakuk	youin				
alphabet mark]											
Numbering	CMP_MAS61015										

### Objectives of class

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

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

#### Contents of class

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

Consult with your advisor for any further details.

#### Self Preparation and Review

Consult with your advisor for them.

Related subjects

Consult with your advisor for them.

#### Notes for textbook

Consult with your advisor for them.

#### Notes for reference

#### Goals to be achieved

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

#### Evaluation of achievement

Three faculty members will be assigned to prepare the evaluation for your thesis research, based on publication records, master thesis, and oral presentation. It will be then finalized by the faculty meeting.

[Evaluation basis] Students who attend this class will be evaluated as follows:

- S: Achieved the high level of "master degree", 90 or higher (out of 100 points).
- A: Left something to be desired, 80 or higher (out of 100 points).
- B: Left something to be desired, 70 or higher (out of 100 points).
- C: Left much to be desired, 60 or higher (out of 100 points).

Examination

試験期間中には何も行わない

None during exam period

Decails of examination

Other information

**Reference URL** 

### Office hours

#### Relations to attainment objectives of learning and education

(D) Communication skills for global success

Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members

(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

(D2) Have high-level skills to mutually respect the values of individual team members; and to contribute to the team's achievements through working cooperatively with other team members

## (M4361003T)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	_	0	01							
Schedule number	M4361003T	Subject area	Advanced	Required or	Required						
			Computer	elective							
			Science and								
			Engineering								
Time of starting a course	Year	Day of the	Intensive	Credit(s)	6						
		week,period									
Faculty	Graduate Progran	Graduate Program for Master's Degree Subject grade 2~									
Department Offered	Computer Scienc	e and Engineering		Beggining	M2						
	00万批改千号 0										
Charge teacher name[Roman	53 杀 牧 務 安 貝, 5	S糸合名貝 JKei Kyoi	mu lin-S, skei kakuk	youin							
alphabet mark]	CMP MAS61015										
Numbering	CIVIF_IVIA301013										
Objectives of class											
The course is intended for stud	ents to study bas	sic materials in dep	th, related to his/	ner research subje	ects in computer						
science and engineering.											
It is also aimed for students to a		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				-							
relevant textbooks/research pape	ers and report on th	nem, as well as to p	resent and discuss (	on the research wo	ork of their own.						
Self Preparation and Review					4						
After the guidance by an indivi	dual adviser, the s	tudent is expected	to conduct his/he	er research on his	/her own with a						
pioneering spirit.											
Related subjects											
Consult 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	resentation.							
Evaluation of achievement											
Will be evaluated by taking into a	account various fac	tors overall, such a	s technical explana	tion, question answ	vering, discussion						
involvements and so on.											
[Evaluation basis] Students who	attend this class wi	ll be evaluated as fo	llows:								
S: Achieved the high level of "ma	ster degree", 90 or	higher (out of 100	points).								
A: Left something to be desired,	80 or higher (out of	100 points).									
B: Left something to be desired,	70 or higher (out of	100 points).									
C: Left much to be desired, 60 or	higher (out of 100	points).									
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	s of learning and e	ducation									

(D) Communication skills for global success

Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members

(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

(D2) Have high-level skills to mutually respect the values of individual team members; and to contribute to the team's achievements through working cooperatively with other team members

# (M43610040)Seminar on Computer Science and Engineering[Seminar on Computer Science and Engineering]

Subject name[English]	Seminar on Co Engineering]	mputer Science a	nd Engineering[Ser	minar on Comput	er Science an
Schedule number	M43610040	Subject area	Advanced	Required or	Required
			Computer	elective	. loqui ou
			Science and	0100040	
T'	X	Due of the	Engineering	0	0
Time of starting a course	Year	Day of the	Intensive	Credit(s)	6
		week,period			
Faculty	_	m for Master's Degr	e	Subject grade	2~
Department Offered	Computer Science	e and Engineering		Beggining	M2
				grade	
Charge teacher name[Roman	S3系教務委員 3	lkei kyomu Iin−S			
alphabet mark]					
Numbering	CMP_MAS61015				
Objectives of class					
技術情報を理解、説明、質疑・応 The course is intended for stu science and engineering. it is also aimed for students to and technical discussion and wri	dents to study bas acquire various ski	sic materials in dep		-	
relevant textbooks/research pap Self Preparation and Review 教員が指定する内容に関し、予	ers and report on t			,	
relevant textbooks/research pap Self Proparation and Roview 教員が指定する内容に関し、予 Consult with your advisor. Related subjects 指導教員に問い合わせること。 Consult with your advisor.	ers and report on t			,	
relevant textbooks/research pap Self Proparation and Roview 教員が指定する内容に関し、予 Consult with your advisor. Related subjects 指導教員に問い合わせること。 Consult with your advisor.	ers and report on t			,	
relevant textbooks/research pap Self Proparation and Roview 教員が指定する内容に関し、予 Consult with your advisor. Related subjects 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。	ers and report on t			,	
While specific contents depend relevant textbooks/research pap Self Preparation and Review 教員が指定する内容に関し、予 Consult with your advisor. Related subjects 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	ers and report on t			,	
relevant textbooks/research pap Self Preparation and Review 教員が指定する内容に関し、予 Consult with your advisor. Related subjects 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 (3)論文の標準的な構成ができ。 (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 information by ora	ers and report on t 習・復習を行う。 理解でき、わかりや 解釈でき、作文できる。 提供ができる。 だで指摘できる。 ure on state-of-the ation written in Engl tion of a technical p il presentation.	hem, as well as to p つすく説明できる。 る。 art areas of expert lish, and to write suc paper.	ise, and to explain o	on the research wo	
relevant textbooks/research pap Self Preparation and Review 教員が指定する内容に関し、予 Consult with your advisor. Related subjects 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 (3)論文の標準的な構成ができ。 (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 (4) To provide information by ora	ers and report on t 習・復習を行う。	hem, as well as to p pすく説明できる。 a-art areas of expert lish, and to write suc paper. s. 程度、説明の方法、質	resent and discuss of ise, and to explain c sh information in En 訂問への回答、議論	on the research wo clearly. glish. への参加の様子等	ork of their own.

### **Examination** 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

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about computer science and engineering as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as related fields; and to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about computer science and engineering as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

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

Subject name[English]	Networking, Advanced 1[Networki	ng, 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 grade	1~
Department Offered	Computer Science and Engineerin	g		Beggining grade	M1
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/I	Protocols,	ISBN			
	Author	W.	Richard	Publisher	Addison-wesley	Publish year	
		Stever	IS				
Notes for textbook							
TCP/IP Illustrated	Volume. 1, The Prot	tocols,					
W. Richard Stevens	s, Addison-wesley						
	Volumo 1 The Prot						
TCP/IP Illustrated W. Richard Stevens							

Required part of this book will be accessible through the material of lecture. You need not prepare the book.

#### 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 name[English]	Networking, /	Advanced 2[Networki	ng, Advanced 2]			
Schedule number	M43630250		Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a	Fall2 term		Day of the	Wed.2~2	Credit(s)	1
course		6 M - 1 D	week,period		<u>.</u>	
Faculty	Graduate Pro	ogram for Master's De	egree		Subject grade	1~
Department Offered	Computer Sc	cience and Engineerin	g		Beggining grade	M1
Charge teacher name[Roman alphabet mark]	大村 廉 OM	URA Ren			8.444	L
Numbering	CMP_MAS52	325				
The aim of this class is cover both of theoretic The contents will focus distributed systems are The aim of this class is cover both of theoretic The contents will focus distributed systems are	al discussion a s on advanced e required befo s to understanc al discussion a s on advanced	nd practical applicati topics in distributed rehand. I the concepts, syste and practical applicati topics in distributed	ons. systems, namely m architecture, ar ons.	the knowledge of a	computer netwo	ork and basics on the second s
From the 6th to 7th we The 8th week; Examina From the 1st to 2rd we From the 2nd to 3rd we From the 4nd to 5rd we From the 6th to 7th we The 8th week; Examina <b>Self Preparation and R</b> It is strongly recomme	tion or additior eek; Synchroniz eek; Consistend eek; Fault toler eek; Security tion or additior eview	ation cy ance nal topics	ook [«] Distributed	Systems: Drinainla	s and Paradiers	os (2nd Edition
and to search keywords It is strongly recomme and to search keywords	s in the book o Inded to read	n Internet to find pra over the reference b	ctical examples. ook, ″Distributed		0	
Related subjects Computer Network, Op Computer Network, Op	erating System	ns, System Programm	ing, (Basics of Dis			
<b>Notes for textbook</b> Basically, materials refe Basically, materials refe	erenced in the	class are passed out	in the class.			
Reference1	Book title	Distributed systems		paradigms	ISBN	978- 0132392273
	Author	Andrew S. Tanenbaum, Maarten van Steen	Publisher	Pearson Prentice Hall	Publish year	2007
Notes for reference Related materials, such	as books vide	and web perce				

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.

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.

S: 90 and over

A: 80 and over

B: 70 and over

C: 60 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.

S: 90 and over

A: 80 and over

B: 70 and over

C: 60 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

### Reference URL

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

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## 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

(C)高度な知識を統合的に活用できる実践力・創造力 情報・知能工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践的・創 造的能力を身につけている。
(C1) 情報・知能工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけて いる。
(C2) 情報・知能工学およびその関連分野の広範囲の知識の連携により、研究開発に対する方法論を体得して、研究開発の計 画を立案および実践し、課題解決のための新たな技術を創造できる能力を身につけている。 (C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about computer science and engineering as well as related fields; and have the practical and creative skills to utilize suchknowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as related fields; and to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about computer science and engineering as well as related fields; to make plans for research and developmentand put them into practice; and to create new technologies to solve problems

### Key words

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

Subject	Advanced R	obotics and Inform	natics 1[Advanced F	Robotics and Informa	itics 1]	
name[English]						
Schedule number	M43630260		Subject area	Advanced Computer	Required or elective	Elective
				Science and Engineering		
Time of starting a	Fall1 term		Day of the	Tue.3~3	Credit(s)	1
course			week,period	100.0	0.001000	•
Faculty	Graduate Pr	rogram for Master'			Subject	1~
					grade	
Department Offered	Computer S	cience and Engine	ering		Beggining grade	M1
Charge teacher	三浦 純 MII	URA Jun			8.000	
name[Roman						
alphabet mark]						
Numbering	CMP_MAS53	3225				
Objectives of class						
Fundamental and adva	nced issues i	n intelligent robot	tics will be discuss	ed. Topics included	are probabilist	ic sensor fus
techniques (e.g., Kalmar					-	
Contents of class						
Week 1: Introduction to	scene recogn	ition and sensor fu	usion.			
Week 2: Probability basi	-					
Week 3: Kalman filter ar						
Week 4: Probabilistic lo						
Week 5: SLAM 1: Bayes						
Week 6: SLAM 2: Visual						
Week 7: Applications of	0	•				
		ing and localization	1			
		-				
Week 8: Presentations of Self Preparation and Re Regularly reviewing and	of students' re	ports and conclus	ions.	re desirable.		
Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar	of students' re <b>aview</b> preparing for a of linear algel ed. The main r	ports and conclus the lecture using bra and probability reference is showr	ions. provided materials a r theory is useful. n below.	re desirable.		
Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar	of students' re <b>sview</b> preparing for of linear algel	the lecture using bra and probability	ions. provided materials a r theory is useful. n below.	re desirable.	ISBN	978-
Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar	of students' re preparing for of linear algel ed. The main r Book title	the lecture using the lecture	ions. provided materials a r theory is useful. n below. pbotics			0262201629
Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar	of students' re <b>aview</b> preparing for a of linear algel ed. The main r	the lecture using the lecture using the lecture using the lecture using the and probability reference is shown Probabilistic Roman S. Thrun, W	ions. provided materials a r theory is useful. n below. obotics W. <b>Publisher</b>	re desirable.	ISBN Publish year	
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Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar Reference1	of students' re preparing for of linear algel ed. The main r Book title	the lecture using the lecture using the lecture using the lecture using the and probability reference is shown Probabilistic Roman S. Thrun, W	ions. provided materials a r theory is useful. n below. obotics W. <b>Publisher</b>			0262201629
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Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar Reference1 Notes for reference Goals to be achieved (1) Understanding of the (2) Understanding of sta	of students' re preparing for of linear algel ed. The main r Book title Author e fundamentals atistical approx	the lecture using the lecture using bra and probability reference is shown Probabilistic Ro S. Thrun, W Burgard, D. Fox	ions. provided materials a theory is useful. below. bobotics V. Publisher	The MIT Press	Publish year	0262201629
Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar Reference1 Notes for reference Goals to be achieved	of students' re preparing for of linear algel ed. The main r Book title Author e fundamentals atistical approx	the lecture using the lecture using bra and probability reference is shown Probabilistic Ro S. Thrun, W Burgard, D. Fox	ions. provided materials a theory is useful. below. bobotics V. Publisher	The MIT Press	Publish year	0262201629
Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar Reference1 Notes for reference Goals to be achieved (1) Understanding of the (2) Understanding of sta Evaluation of achievement	of students' re preparing for of linear algel ed. The main r Book title Author e fundamentals atistical approx ent	the lecture using the lecture	ions. provided materials a theory is useful. below. bobotics N. Publisher tion. ues for localization,	The MIT Press	Publish year	0262201629
Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar Reference1 Notes for reference Goals to be achieved (1) Understanding of the (2) Understanding of sta Evaluation of achievement The grade will be deterr	of students' re preparing for of linear algel ed. The main r Book title Author e fundamentals atistical approx ent nined by the f	the lecture using the lecture	ions. provided materials a theory is useful. below. bobotics N. Publisher tion. ues for localization,	The MIT Press	Publish year	0262201629
Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar Reference1 Notes for reference Goals to be achieved (1) Understanding of the (2) Understanding of sta Evaluation of achievem The grade will be detern S: the total points are 9	of students' re preparing for of linear algel ed. The main r Book title Author e fundamentals atistical approx ent nined by the f 10 or higher.	the lecture using the lecture	ions. provided materials a theory is useful. below. bobotics N. Publisher tion. ues for localization,	The MIT Press	Publish year	0262201629
Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar Reference1 Notes for reference Goals to be achieved (1) Understanding of the (2) Understanding of sta Evaluation of achievem The grade will be detern S: the total points are 8	of students' re preparing for of linear algel ed. The main r Book title Author e fundamentals atistical approx ent nined by the f 10 or higher. 30 or higher.	the lecture using the lecture	ions. provided materials a theory is useful. below. bobotics N. Publisher tion. ues for localization,	The MIT Press	Publish year	0262201629
Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar Reference1 Notes for reference Goals to be achieved (1) Understanding of the (2) Understanding of sta	of students' re preparing for of linear algel ed. The main r Book title Author e fundamentals atistical approx ent nined by the f 10 or higher. 20 or higher.	the lecture using the lecture	ions. provided materials a theory is useful. below. bobotics N. Publisher tion. ues for localization,	The MIT Press	Publish year	0262201629
Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar Reference1 Notes for reference Goals to be achieved (1) Understanding of the (2) Understanding of sta Evaluation of achievem The grade will be detern S: the total points are 8 B: the total points are 7	of students' re preparing for of linear algel ed. The main r Book title Author e fundamentals atistical approx ent nined by the f 10 or higher. 20 or higher.	the lecture using the lecture	ions. provided materials a theory is useful. below. bobotics N. Publisher tion. ues for localization,	The MIT Press	Publish year	0262201629
Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar Reference1 Notes for reference Goals to be achieved (1) Understanding of the (2) Understanding of the (2) Understanding of the (2) Understanding of the Evaluation of achievem The grade will be detern S: the total points are 8 B: the total points are 6 B: the total points are 6	of students' re preparing for of linear algel ed. The main r Book title Author e fundamentals atistical approx ent nined by the f 10 or higher. 20 or higher.	the lecture using the lecture	ions. provided materials a theory is useful. below. bobotics N. Publisher tion. ues for localization,	The MIT Press	Publish year	0262201629
Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar Reference1 Notes for reference Goals to be achieved (1) Understanding of the (2) Understanding of the (2) Understanding of sta Evaluation of achievem The grade will be deterr S: the total points are 9 A: the total points are 6 B: the total points are 6 Examination	of students' re preparing for of linear algel ed. The main r Book title Author e fundamentals atistical approx ent nined by the f 10 or higher. 20 or higher.	the lecture using the lecture	ions. provided materials a theory is useful. below. bobotics N. Publisher tion. ues for localization,	The MIT Press	Publish year	0262201629
Week 8: Presentations of Self Preparation and Re Regularly reviewing and Related subjects Fundamental knowledge Notes for textbook Handouts will be prepar Reference1 Notes for reference Goals to be achieved (1) Understanding of the (2) Understanding of the (3) Understanding of the (3) Understanding of the (4) Understanding of the (5) the total points are 9 A: the total points are 6 B: the total points are 6 Examination レポートで実施	e fundamentals atistical approx ent nined by the f 0 or higher. 20 or higher.	the lecture using the lecture	ions. provided materials a theory is useful. below. bobotics N. Publisher tion. ues for localization,	The MIT Press	Publish year	0262201629

Room C-604, Ext. 6773, Email: jun.miura@tut.jp (Jun Miura)

#### **Reference URL**

http://www.aisl.cs.tut.ac.jp/classes/robotics-and-informatics/ 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

(C)高度な知識を統合的に活用できる実践力・創造力

情報・知能工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。

(C1) 情報・知能工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about computer science and engineering as well as related fields, and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as related fields, and to utilize such knowledge in an integrated manner

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about computer science and engineering as well as related fields; and have the practical and creative skills to utilize suchknowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as related fields; and to utilize such knowledge in an integrated manner

Key words Robotics

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

Subject name[English]	Advanced Ro	botics and Information	cs 2[Advan	ced Ro	obotics and Informat	ics 2]	
Schedule number	M43630270		Subject a	rea	Advanced	Required or	Elective
			-		Computer	elective	
					Science and		
					Engineering		
Time of starting a course	Fall2 term		Day of week,per		Tue.3~3	Credit(s)	1
Faculty	Graduate Pr	ogram for Master's D		u		Subject	1~
radulty			ogioo			grade	•
Department Offered	Computer Sc	cience and Engineerir	וס			Beggining	M1
Boparanone onorou	Computer et		'8			grade	
Charge teacher	岡田 美智明	OKADA Michio				8.440	
name[Roman alphabet		,					
mark]							
Numbering	CMP_MAS53	225					
-		220					
認知的なロボティクスの	歴史的背景, 制	犬況的な認知とロホッ	小の身体性	,社会	会的相互行為,社会1	的なロボットの社	L会実装などに
ついて学ぶ.							
Fundamental and advan	ced issues on	social robotics will	be discuss	ed su	ch as historical bac	kground of com	nitive robotics
embodied cognition, orga							
Contents of class	_						
講義内容は次の通りとす	-3.						
- Historical background	of cognitive ro	botics					
- Situated cognition and	biological-insp	pired robots					
- Embodiment and socia	l embeddednes	s					
- Organizing social intera	action in social	l robots					
- Socially assistive robo	tics						
- Presentation and discu	ission						
Listerie al bashmannad	. <b>c</b>	L					
- Historical background	-						
- Situated cognition and							
<ul> <li>Embodiment and socia</li> </ul>							
- Organizing social intera							
- Communication metho	-	L					
<ul> <li>Socially assistive robot</li> </ul>							
- 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	ed.					
Related subjects							
Fundamentals of cogniti	ve science.						
Fundamentals of cogniti	ve science.						
Notes for textbook							
ハンドアウトを用意します	-						
Handouts will be prepare	d.						
Reference1	Book title	Understanding Inte	elligence			ISBN	
		_	-				0001
	Author	R. Pfeifer, C.	Publisher		MIT Press	Publish year	2001
		Scheier					l
Notes for reference							
特になし							

N1 ZA
N/A
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.
<ul> <li>Historical background of cognitive robotics</li> </ul>
<ul> <li>Situated cognition and biological-inspired robots</li> </ul>
<ul> <li>Embodiment and social embeddedness</li> </ul>
<ul> <li>Organizing social interaction in social robots</li> </ul>
- Socially assistive robotics
Understanding of the fundamentals of social robotics including:
<ul> <li>Historical background of cognitive robotics</li> </ul>
<ul> <li>Situated cognition and biological-inspired robots</li> </ul>
<ul> <li>Embodiment and social embeddedness</li> </ul>
– Organizing social interaction in social robots
- Communication methodologies in HRI
- Socially assistive robotics
Evaluation of achievement
プレゼンテーション(50%)と最終レポート(50%)の内容で評価する.
S:合計点が 90 点(100 点満点)以上。
A:合計点が 80 点(100 点満点)以上。
B:合計点が 70 点(100 点満点)以上。
C:合計点が 60 点(100 点満点)以上。
Evaluation will be determined by the presentations in the class(50%) and final report(50%).
S: total points of reports, 90 or higher (out of 100 points).
A: total points of reports, 80 or higher (out of 100 points).
B: total points of reports, 70 or higher (out of 100 points).
C: total points of reports, 60 or higher (out of 100 points).
Examination
レポートで実施
By Report
Details of examination
特になし
N/A
Other information
Room F-402, Ext, 6886, Email: okada[at]tut.jp (Michio Okada)
Room F-402, Ext. 6886, Email: okada[at]tut.ip (Michio Okada)
Reference URL
http://www.icd.cs.tut.ac.jp/
http://www.icd.cs.tut.ac.jp/en/profile.html
火曜日,14:30-16:00
Tuesday, 14:30-16:00
Relations to attainment objectives of learning and education
(C1) 情報・知能工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけて
いる。
(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as
related fields; and to utilize such knowledge in an integrated manner
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 System 1]	s and Intelligent Info	rmatics 1[Complex	Systems and Intell	igent Informatio
Schedule number	M43630300	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Fall1 term	Day of the week,period	Wed.3~3	Credit(s)	1
Faculty	Graduate Program	n for Master's Degre	e	Subject grade	1~
Department Offered	Computer Scienc	e and Engineering		Beggining grade	M1
Charge teacher name[Roman alphabet mark]	村越 一支 MUR/	AKOSHI Kazushi			
Numbering	CMP_MAS53125				
Objectives of class					
The aim of this class is to unders	tand complex and i	ntelligent systems.			
To achieve the aim, this class off	-		al modeling and sin	nulation methods.	
Contents of class					
A. Introduction					
What is complex and intelligent sy	stems? Outline of	the brain system			
B. Computational Neuroscience a		-	Models		
What is computational Neuroscier					
C. Model Neurons					
Structure of neurons, synapse, m	odel neurons.				
D. Learning at connected part of					
Synaptic plasticity, spike-timing-					
E. Simulation Methods		, (0.2.)			
Numerical calculation methods fo	r single neuron, nei	ural network from sin	gle neuron		
F. Simulation Environments					
Explanation and demonstration of	simulation environ	ments such as NFU	RON and GENESIS		
G. Self-organizing					
What is self-organizing? Winner T H. Reinforcement Learning	akes All, Self-orga	nizing map (SOM)			
What is reinforcement learning,	reinforcement lear	ning in the brain d	emonstration of re	inforcement learnir	g for controllir
robot	reinforcement lear				
I. Summary					
1st week: A					
2nd week: B					
3rd week: C					
4th week: D					
5th week: E F					
6th week: G					
7th week: H I					
Self Preparation and Review					
Related subjects					
-					
Related subjects Notes for textbook Handouts are distributed.					
Notes for textbook					
Notes for textbook Handouts are distributed.					
Notes for textbook Handouts are distributed. Notes for reference	nathematical model	s, and understand th	nem at the degree v	which you can simu	Ite them by yo

- 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

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about computer science and engineering as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner (C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as

related fields; and to utilize such knowledge in an integrated manner

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

Subject name[English]	Complex System 2]	s and Intelligent In	formatics 2[Complex	Systems and Inte	lligent Informatic
Schedule number	M43630310	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Fall2 term	Day of the week,period	Wed.3~3	Credit(s)	1
Faculty	Graduate Progra	m for Master's Deg	ree	Subject grade	1~
Department Offered	Computer Science	e and Engineering		Beggining grade	M1
Charge teacher name[Roman alphabet mark]	石田 好輝 ISHID	)A Yoshiteru		grado	<u> </u>
Numbering	CMP_MAS53125				
Objectives of class					
This course provides opportunitie	s to learn the follo	wings:			
* Modeling and analysis on compl		-			
* System theoretic analysis on co	-		i.		
* Computer simulations and implie			,		
* Implementation of complex syst		systems.			
Recent topics on complex system			iscussed in the cours	se.	
				. = .	
Contents of class					
1. Introduction on complex dynam	ical systems				
2. Dynamical systems	iou systems				
<ol> <li>Dynamical systems</li> <li>Complex networks and interact</li> </ol>	ions				
4. Cellular automata and neural ne					
5. Information Processing by com					
	-				
6. Emergence of cooperation in au 7. Learning algorithms for agents	aconomous agents				
7. Learning algorithms for agents	nto				
8. Evolutionary algorithms for age					
9. Biological systems and information and Review	LIGH processing				
	sture based on the	materiale provide	d in the lecture		
Reviewing and studying for the lease Related subjects	sture based on the	materials provide	a in the lecture.		
-	n theory dispersts	mathematics and	artificial intelligence		
The basic knowledge about system	n meory, discrete	mathematics and a	a cincial intelligence.		
Notes for textbook			4 .l		
No textbook. References other th		iggested at the firs	ET CIASS.		
Ishida, Y.: Self-Repair Networks, S		١.			
Ishida, Y.: Immunity-Based System		);			
Barabasi, A.L.: Linked, Perseus, (2					
Strogatz, S. H. Sync, Hyperion (2	003)				
Notes for reference					
特になし N/A					
Goals to be achieved					
	ramework for the	problem coluing			
<ol> <li>Understanding how to set up f</li> <li>Building and modeling the syst</li> </ol>		-	tatuna decima ara zar	scible	
(2) Building and modeling the syst Evaluation of achievement	om so that simula	uons anu even pro	cocype design are pos	סוטוכ.	
	-and range (EON)				
Class performance (50%) and tern	enu report (50%)				
Course Evaluation		(ama) ar - 1	100		
Evaluation is based on class perfo					
S: total points of reports and pres					
A: total points of reports and pres					
B: total points of reports and pres					
C: total points of reports and pres	sentations, 60 or h	igher (out of 100 p	oints).		
Examination					
その他					

Other	
Details of examination	
特になし	
N/A	
Other information	
Room F-504, Ext. 6895	
Reference URL	
特になし	
N/A	
Office hours	
After the class	
Relations to attainment objectives of learning and education	
<ul> <li>(C)高度な知識を統合的に活用できる実践力・創造力 情報・知能工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用で 造的能力を身につけている。</li> <li>(C1) 情報・知能工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能いる。</li> <li>(C) Practical and creative skills to utilize advanced knowledge in an integrated manner</li> <li>Have advanced knowledge about computer science and engineering as well as related fields; and have th creative skills to utilize such knowledge for problem solving in an integrated manner</li> <li>(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engine related fields; and to utilize such knowledge in an integrated manner</li> </ul>	力を身につけて ne practical and
<ul> <li>(C) Practical and creative skills to utilize advanced knowledge in an integrated manner</li> <li>Have advanced knowledge about computer science and engineering as well as related fields; and have th</li> <li>creative skills to utilize suchknowledge for problem solving in an integrated manner</li> <li>(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engine</li> <li>related fields; and to utilize such knowledge in an integrated manner</li> </ul>	

Key words

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

# (M43630370)Image Processing, Advanced 1[Image Processing, Advanced 1]

Subject name[English]		ssing, Advanced 1[Ima	ge Processing, A			
Schedule number	M43630370		Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a	Fall1 term		Day of the	Tue.2~2	Credit(s)	1
course Faculty	Graduate Pro	ogram for Master's De	gree		Subject grade	1~
Department Offered	Computer So	cience and Engineering	ţ		Beggining grade	M1
Charge teacher name[Roman alphabet mark]	金澤 靖 KAI	NAZAWA Yasushi			Brade	
Numbering	CMP_MAS53	225				
Objectives of class						
This course involves fu	ndamentals and	l advanced issues on i	mage processing	and computer vision		
Contents of class						
1: Introduction						
2: Projective Geometry						
3: Epipolar Geometry						
4: 3-D Reconstruction	from Two View	S				
5: Affine Projection						
6: Uncalibrated Stereo						
7: Structure from Motio	n					
8: Experiments						
1: Introduction						
2: Projective Geometry						
3: Epipolar Geometry 4: 3-D Reconstruction	From Two View					
5: Affine Projection	from two views	5				
6: Uncalibrated Stereo						
7: Structure from Motic	n					
8: Experiments						
Self Preparation and R	eview					
The handouts are availa	ble via web pa	ge beforehand.				
The handouts are availa	ble via web pa	ge beforehand.				
Related subjects						
Geometry, Linear Algeb	ra, Statistics.					
Geometry, Linear Algeb	ra, Statistics.					
Notes for textbook						
Handouts will be prepar					I	
Handouts will be prepar						
	Book title	Multiple View Geom	-		ISBN	
Handouts will be prepar		R.I. Hartley and A.	etry <b>Publisher</b>	Cambridge	ISBN Publish year	2000
Handouts will be prepar Reference1	Book title Author	R.I. Hartley and A. Zisserman	Publisher	University Press	Publish year	2000
Handouts will be prepar	Book title Author Book title	R.I. Hartley and A. Zisserman Computer Vision	Publisher A Modern Appro	University Press ach	Publish year ISBN	
Handouts will be prepar Reference1	Book title Author	R.I. Hartley and A. Zisserman Computer Vision D.A. Forsyth and	Publisher	University Press	Publish year	2000
Handouts will be prepar Reference1 Reference2	Book title Author Book title Author	R.I. Hartley and A. Zisserman Computer Vision D.A. Forsyth and J. Ponce	Publisher A Modern Appro Publisher	University Press ach	Publish year ISBN Publish year	
Handouts will be prepar Reference1	Book title Author Book title Author Book title	R.I. Hartley and A. Zisserman Computer Vision D.A. Forsyth and J. Ponce Guide to 3D Vision	Publisher A Modern Appro Publisher Computation	University Press ach Prentice Hall	Publish year ISBN Publish year ISBN	2003
Handouts will be prepar Reference1 Reference2	Book title Author Book title Author	R.I. Hartley and A. Zisserman Computer Vision D.A. Forsyth and J. Ponce Guide to 3D Vision K. Kanatani, Y.	Publisher A Modern Appro Publisher	University Press ach	Publish year ISBN Publish year	
Handouts will be prepar Reference1 Reference2	Book title Author Book title Author Book title	R.I. Hartley and A. Zisserman Computer Vision D.A. Forsyth and J. Ponce Guide to 3D Vision	Publisher A Modern Appro Publisher Computation	University Press ach Prentice Hall	Publish year ISBN Publish year ISBN	2003

Notes for reference

Goals to be achieved	
	nentals and advanced issues on image processing and computer vision including:
- camera model,	
– epipolar geometry,	
- 3-D reconstruction from in	nages.
- optimization	114500,
•	entals and advanced issues on image processing and computer vision including:
- camera model,	
<ul> <li>epipolar geometry,</li> </ul>	
- 3-D reconstruction from in	nages
- optimization	114500,
Evaluation of achievement	
Grade will be determined by	all submitted reports:
S: score >= 90	
A: score >= 80	
B: score $\geq 70$	
C: score $\geq -70$	
Grade will be determined by	all submitted reports:
S: score $\geq$ = 90	
A: score $\geq 80$	
B: score >= 70	
C: score $\geq 60$	
Examination	
レポートで実施	
By Report	
Details of examination	
Other information	
Room F-404, Ext. 6888, Ema	il: kanazawa@cs.tut.ac.jp (Yasushi Kanazawa)
Room F-404, Ext. 6888, Ema	il: kanazawa@cs.tut.ac.jp (Yasushi Kanazawa)
Reference URL	
http://www.img.cs.tut.ac.jp/	
http://www.img.cs.tut.ac.jp/ Office hours	
Relations to attainment obje	ctives of learning and education
Telacione co accaminent obje	
(C) Practical and creative sk	ills to utilize advanced knowledge in an integrated manner
Have advanced knowledge	about computer science and engineering as well as related fields; and have the practical a
creative skills to utilize such	knowledge for problem solving in an integrated manner
(C1) Have the skills to volu	ntarily acquire theories and applied knowledge about computer science and engineering as well
	such knowledge in an integrated manner
Key words	
image processing, computer	vision

image processing, computer vision

# (M43630380)Image Processing, Advanced 2[Image Processing, Advanced 2]

Schedule number Time of starting a course Faculty Department Offered	M43630380 Fall2 term		Subject area	Advanced Computer	Required or elective	Elective
course Faculty	Fall2 term			Science and Engineering		
Faculty			Day of the week,period	Tue.2~2	Credit(s)	1
Department Offered	Graduate Pro	ogram for Master's De			Subject grade	1~
Department Onered	Computer So	cience and Engineering	g		Beggining grade	M1
Charge teacher name[Roman alphabet mark]	菅谷 保之 S	SUGAYA Yasuyuki			Braco	
Numbering	CMP_MAS53	225				
<b>Objectives of class</b> このコースではコンピュ- This course involves fur				puter vision.		
Contents of class						
1: Mathematical Introduc	tion					
2: Limits of Functions						
3: Optimization of Funct	ions					
4: Least Squares						
5: Advance of Least Squ	iares					
6: Non-linear Optimizati						
7: Maximum Likelihood						
8: Examination						
1: Mathematical Introduc	tion					
2: Limits of Functions						
3: Optimization of Funct	ions					
4: Least Squares						
5: Advance of Least Squ	iares					
6: Non-linear Optimizati	on					
7: Maximum Likelihood						
8: Examination						
Self Preparation and Re	view					
The handouts are availa	ole via web pag	ge beforehand.				
The handouts are availa	ole via web pa	ge beforehand.				
Related subjects						
Geometry, Linear Algebr	a, Statistics.					
Geometry, Linear Algebr	a, Statistics.					
Notes for textbook						
Handouts will be prepare						
Handouts will be prepare	ed.					
Reference 1	Book title	Multiple View Geom	netry		ISBN	
	Author	R.I. Hartley and A. Zisserman	Publisher	Cambridge University Press	Publish year	2000
Reference2	Book title	Computer Vision	- A Modern Appro		ISBN	
	Author	D.A. Forsyth and J. Ponce	Publisher	Prentice Hall	Publish year	2003
Reference3	Book title	Guide to 3D Vision	Computation	1	ISBN	
	Author	K. Kanatani, Y.	Publisher	Springer	Publish year	2016

Notes for reference

:
:
:
:

#### (M44610050)Seminar on Applied Chemistry and Life Science 1[Seminar on Applied Chemistry and Life Science 1]

Subject name[English]	Seminar on App Science 1]	lied Chemistry and I	_ife Science 1[Sem	inar on Applied Cl	nemistry and Lif
Schedule number	M44610050	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	3
Faculty	Graduate Progra	m for Master's Degre	e	Subject grade	1~
Department Offered	Applied Chemist	ry and Life Science		Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S4系教務委員 4	łkei kyomu Iin−S		<b>B</b> igne	
Numbering	CHE_MAS55015				
<b>Objectives of class</b> This course will provide the stud science by reading textbooks an students is to learn knowledge an understanding of applied chemistr	d scientific papers d presentation ski	s under the guidance	e of his/her superv	isor. The aim of t	ne lessen for th
Contents of class	-				
The students will be required to r	read textbooks and	d papers written by a	other language than	Japanese, especia	ally English, whic
are suggested by his/her supervis					
Self Preparation and Review					
Notes for textbook Supervisor will recommend textbo Notes for reference Goals to be achieved To acquire basic knowledge on ap To understand the contents of so To be able to make oral and poste Evaluation of achievement The evaluation is based on the shis/her research in the seminar. H S: 90 or higher (out of 100 points)	plied chemistry an ientific papers in a er presentations re scores of reading dis/her supervisor ),	nd life science a given field of applie elevant to papers he/ textbooks and scien	d chemistry and life ⁄she has read tific papers, discus		presentations o
A: 80 or higher (out of 100 points)					
B: 70 or higher (out of 100 points)					
C: 60 or higher (out of 100 points	)				
Examination					
試験期間由にけ何またわたい					
試験期間中には何も行わない					
試験期間中には何も行わない None during exam period <b>Details of examination</b>					
None during exam period					
None during exam period Details of examination Other information					
None during exam period Details of examination Other information Supervisor(s)					
None during exam period Details of examination Other information Supervisor(s) Reference URL					
None during exam period Details of examination					
None during exam period Details of examination Other information Supervisor(s) Reference URL http://chem.tut.ac.jp/en/	by appointment.				
None during exam period Details of examination Other information Supervisor(s) Reference URL http://chem.tut.ac.jp/en/ Office hours		aducation			

応用化学・生命工学およびその関連分野に関する高度な知識を修得し,それらを課題解決のために統合的に活用できる実践 的・創造的能力を身につけている。

(C1) 応用化学・生命工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。

(C2) 応用化学・生命工学およびその関連分野の広範囲の知識の連携により,研究開発に対する方法論を体得して,研究開発の計画を立案および実践し,課題解決のための新たな技術を創造できる能力を身につけている。 (D)グローバルに活躍できるコミュニケーションカ

グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で,自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。

(D1) 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・発信し, コミュニケーションする能力を身につけている。

(D2) チーム内の個々の要員の価値観を互いに尊重するとともに,協調して,チームとしての目標達成に寄与できる高い能力を 身につけている。

(E)最新の技術や社会環境の変化に対する探究心と持続的学習力

社会,環境,技術等の変化に対応して,生涯にわたって自発的に計画し学習する能力を身につけている。

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

(D) Communication skills for global success

Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members

(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

(D2) Have high-level skills to mutually respect the values of individual team member; and to contribute to the team's achievements through working cooperatively with other team members

(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilizesuch knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and developmentand put them into practice; and to create new technologies to solve problems

(D) Communication skills for global success

Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members

(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

(D2) Have high-level skills to mutually respect the values of individual team member; and to contribute to the team's achievements through working cooperatively with other team members

(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, environment and technology

Key words

Applied chemistry, Life science, Materials science and engineering

#### (M44610060)Seminar on Applied Chemistry and Life Science 2[Seminar on Applied Chemistry and Life Science 2]

Subject name[English]	Seminar on App Science 2]	lied Chemistry and I	_ife Science 2[Sem	iinar on Applied Cl	nemistry and Lil
Schedule number	M44610060	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	3
Faculty	Graduate Progra	m for Master's Degre	e	Subject grade	2~
Department Offered	Applied Chemist	ry and Life Science		Beggining grade	M2
Charge teacher name[Roman	S4系教務委員	4kei kyomu Iin-S		Biado	
alphabet mark]					
Numbering	CHE_MAS65015				
Objectives of class					
Based on the Seminar on App	olied Chemistry an	d Life Science 1, tł	nis course will furt	her provide the s	tudents with th
opportunity to study on his/her	research subject i	n applied chemistry a	and life science by	reading textbooks	and papers unde
the guidance of his/her superv	visor. The students	will learn the know	ledge and the pres	sentation skills req	uired for his/he
research in the seminar.					
Contents of class					
The students will be required to	read textbooks an	d papers written by	other language than	Japanese, especia	ally English, whic
are suggested by his/her superv	visor, and to report	and discuss deeply o	n his/her research	subject in the semi	inar.
Self Preparation and Review					
Related subjects					
Seminar on Applied Chemistry a	nd Life Science 1				
Thesis Research on Applied Che	-				
All other relevant subjects in ap	plied chemistry and	life science			
Notes for textbook					
Supervisor will recommend text	books, papers, and r	research materials to	students.		
Notes for reference					
Goals to be achieved					
To acquire basic knowledge on a	applied chemistry ar	nd life science			
To understand the contents of s	scientific papers in a	a given field of applie	d chemistry and life	e science	
To be able to make oral and pos	ter presentations r	elevant to papers he	∕she has read.		
Evaluation of achievement					
The evaluation is based on the	scores of reading	textbooks and scier	itific papers, discus	sions, reports and	presentations of
his/her research in the seminar.	His/her supervisor	[,] evaluates the score	S.	•••	•
S: 90 or higher (out of 100 point					
A: 80 or higher (out of 100 point					
B: 70 or higher (out of 100 point					
C: 60 or higher (out of 100 point					
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://chem.tut.ac.jp/en/					
Office hours					
Students are encouraged visiting	g by appointment.				
Relations to attainment objectiv		education			
(C)高度な知識を統合的に活用					

応用化学・生命工学およびその関連分野に関する高度な知識を修得し,それらを課題解決のために統合的に活用できる実践 的・創造的能力を身につけている。

(C1) 応用化学・生命工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。

(C2) 応用化学・生命工学およびその関連分野の広範囲の知識の連携により,研究開発に対する方法論を体得して,研究開発の計画を立案および実践し,課題解決のための新たな技術を創造できる能力を身につけている。 (D)グローバルに活躍できるコミュニケーションカ

グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で、自らの考えや成果を効果的に表現するコミュニ

ケーションカを身につけている。 (D1) 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・発信し, コミュニケーショ ンする能力を身につけている。

(D2) チーム内の個々の要員の価値観を互いに尊重するとともに、協調して、チームとしての目標達成に寄与できる高い能力を 身につけている。

(E)最新の技術や社会環境の変化に対する探究心と持続的学習力

社会,環境,技術等の変化に対応して,生涯にわたって自発的に計画し学習する能力を身につけている。

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilizesuch knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and developmentand put them into practice; and to create new technologies to solve problems

(D) Communication skills for global success

Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members

(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

(D2) Have high-level skills to mutually respect the values of individual team member; and to contribute to the team's achievements through working cooperatively with other team members

(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, environment and technology

Key words

(M44610070)Thesis Research on Applied Chemistry and Life Science[Thesis Research on Applied Chemistry and Life Science]

Subject name[English]	Thesis Research	on Ap	plied	Chem	istry and Life Sc	ience[Thesis Res	earch on Applied
	Chemistry and Lif	e Scien	ce]				
Schedule number	M44610070	Subje	ct are	8	Advanced Applied Chemistry and Life Science	Required or elective	Required
Time of starting a course	2Years	Day week.	of	the	Intensive	Credit(s)	6
Faculty	Graduate Program				e	Subject grade	1~1
Department Offered	Applied Chemistry	and Li	fe Sci	ence		Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4	·系各教	〕員 4k	ei kyor	mu Iin−S, 4kei kakul	kyouin	
Numbering	ENV_MAS68015						

### **Objectives of class**

In the course, the students will perform advanced researches on applied chemistry 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 Applied Chemistry and Life Science 1

Seminar on Applied Chemistry and Life Science 2

#### 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 applied chemistry and life science

To master experimental techniques and analytical skills required for research on a given field of applied chemistry and life science

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).

S: 90 or higher (out of 100 points),

A: 80 or higher (out of 100 points),

B: 70 or higher (out of 100 points),

C: 60 or higher (out of 100 points) 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

(M44610070)Thesis Research on Applied Chemistry and Life Science[Thesis Research on Applied Chemistry and Life Science]

Subject name[English]	Thesis Research	on Ap	plied	Chem	istry and Life Sc	ience[Thesis Res	earch on Applied
	Chemistry and Lif	e Scien	ce]				
Schedule number	M44610070	Subje	ct are	8	Advanced Applied Chemistry and Life Science	Required or elective	Required
Time of starting a course	2Years	Day week.	of	the	Intensive	Credit(s)	6
Faculty	Graduate Program				e	Subject grade	1~
Department Offered	Applied Chemistry	and Li	fe Sci	ence		Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4	·系各教	∶員 4k	ei kyor	mu Iin−S, 4kei kakul	kyouin	1
Numbering	CHE_MAS68015						

### **Objectives of class**

In the course, the students will perform advanced researches on applied chemistry 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 Applied Chemistry and Life Science 1

Seminar on Applied Chemistry and Life Science 2

#### 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 applied chemistry and life science

To master experimental techniques and analytical skills required for research on a given field of applied chemistry and life science

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).

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A: 80 or higher (out of 100 points),

B: 70 or higher (out of 100 points),

C: 60 or higher (out of 100 points) 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://chem.tut.ac.jp/en/

## Office hours

Students are encouraged visiting by appointment.

#### Relations to attainment objectives of learning and education

(C)高度な知識を統合的に活用できる実践力・創造力

応用化学・生命工学およびその関連分野に関する高度な知識を修得し,それらを課題解決のために統合的に活用できる実践 的・創造的能力を身につけている。

(C1) 応用化学・生命工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。

(C2) 応用化学・生命工学およびその関連分野の広範囲の知識の連携により,研究開発に対する方法論を体得して,研究開発の計画を立案および実践し,課題解決のための新たな技術を創造できる能力を身につけている。 (D)グローバルに活躍できるコミュニケーションカ

グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で、自らの考えや成果を効果的に表現するコミュニ ケーションカを身につけている。

(D1) 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・発信し, コミュニケーションする能力を身につけている。

(D2) チーム内の個々の要員の価値観を互いに尊重するとともに、協調して、チームとしての目標達成に寄与できる高い能力を 身につけている。

(E)最新の技術や社会環境の変化に対する探究心と持続的学習力

社会,環境,技術等の変化に対応して,生涯にわたって自発的に計画し学習する能力を身につけている。

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilizesuch knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

(D) Communication skills for global success

Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members

(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

(D2) Have high-level skills to mutually respect the values of individual team member; and to contribute to the team's achievements through working cooperatively with other team members

(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, environment and technology

Key words

(M4461007T)Thesis Research on Applied Chemistry and Life Science[Thesis Research on Applied Chemistry and Life Science]

Subject name[English]	Thesis Research	on Ap	plied	Chem	istry and Life Sc	ience[Thesis Res	earch on Applied
	Chemistry and Lif	e Scien	ce]				
Schedule number	M4461007T	Subje	ct are	8	Advanced Applied Chemistry and Life Science	Required or elective	Required
Time of starting a course	Year	Day week.	of	the I	Intensive	Credit(s)	6
Faculty	Graduate Program				e	Subject grade	2~
Department Offered	Applied Chemistry	and Li	fe Sci	ence		Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4	·系各教	∶員 4k	ei kyor	mu Iin−S, 4kei kakul	kyouin	1
Numbering	CHE_MAS68015						

### **Objectives of class**

In the course, the students will perform advanced researches on applied chemistry 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 Applied Chemistry and Life Science 1

Seminar on Applied Chemistry and Life Science 2

#### 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 applied chemistry and life science

To master experimental techniques and analytical skills required for research on a given field of applied chemistry and life science

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).

S: 90 or higher (out of 100 points),

A: 80 or higher (out of 100 points),

B: 70 or higher (out of 100 points),

C: 60 or higher (out of 100 points) Examination

None during exam period

#### **Details of examination**

Other information

Supervisor(s)

Reference URL

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

Office hours

Students are encouraged visiting by appointment. Relations to attainment objectives of learning and education

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

(D) Communication skills for global success

Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members

(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

(D2) Have high-level skills to mutually respect the values of individual team member; and to contribute to the team's achievements through working cooperatively with other team members

(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

### Key words

# (M44610080)Seminar on Applied Chemistry and Life Science[Seminar on Applied Chemistry and Life Science]

Subject name[English]	Seminar on Ap Science]	plied Chemistry and	Life Science[Semi	nar on Applied Ch	emistry and Li
Schedule number	M44610080	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Progr	am for Master's Degr	ee	Subject grade	2~
Department Offered	Applied Chemis	try and Life Science		Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S4系教務委員	4kei kyomu Iin−S			
Numbering	CHE_MAS65015	5			
Objectives of class					
This course will provide the stu science by reading textbooks ar the presentation skills required f <b>Contents of class</b>	nd papers under th	e guidance of his/he			
	to read textbool	ke and nanere writt	an by foreign lang	iare that are indi	nated by his/h
The students will be expected supervisor, and report and discu				age that are indi-	cated by his/h
Self Preparation and Review	ss ucepty on ms/m	er researen subject i	THE SCHILLER.		
Son i Toparadon and Novidw					
Palatad aubiaata					
Related subjects	mintry and life C-	ionoo			
Thesis Research on Applied Che	-				
All other relevant subjects in Ap Notes for textbook	plied Griemistry ar	IU LITE SCIENCES			
Supervisor will recommend texts	books and papers t	o students.			
Notes for reference					
<u></u>					
Goals to be achieved					
To acquire basic knowledge on a					
To understand the contents of s To be able to make oral and pos				escience	
Evaluation of achievement					
The evaluation is based on the	scores of reading	g papers, discussions	, reports and prese	ntations of his/he	r research in tl
seminar. His/her supervisor eval					•
S: 90 or higher (out of 100 point					
A: 80 or higher (out of 100 point					
B: 70 or higher (out of 100 point					
C: 60 or higher (out of 100 point					
Examination					
試験期間中には何も行わない					
None during exam period					
Details of examination					
Downo VI OrannilaUVII					
Other information					
Supervisor					
Supervisor Reference URL					
Supervisor <b>Reference URL</b> http://chem.tut.ac.jp/en/					
Supervisor Reference URL http://chem.tut.ac.jp/en/ Office hours					
Supervisor Reference URL http://chem.tut.ac.jp/en/ Office hours Students are encouraged visiting					
Supervisor Reference URL http://chem.tut.ac.jp/en/ Office hours		education			
Supervisor Reference URL http://chem.tut.ac.jp/en/ Office hours Students are encouraged visiting		education			
Supervisor Reference URL http://chem.tut.ac.jp/en/ Office hours Students are encouraged visiting		education			

Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

(D) Communication skills for global success

Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members

(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

(D2) Have high-level skills to mutually respect the values of individual team member; and to contribute to the team's achievements through working cooperatively with other team members

(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

## Key words

# (M44630070)Advanced Polymer Chemistry[Advanced Polymer Chemistry]

			ced Polymer Chemi		[
Schedule number	M44630070	Subject area	Advanced	Required or	Elective
			Applied	elective	
			Chemistry and		
			Life Science		
Time of starting a course	Fall1 term	Day of the week,period	Tue.2~2	Credit(s)	1
Faculty	Graduate Progra	n for Master's Degr	ee	Subject grade	1~
Department Offered	Applied Chemistr	y and Life Science		Beggining grade	M1
Charge teacher name[Roman	伊津野 真一,原	口 直樹 ITSUNO S	hinichi, HARAGUCH	I Naoki	I
alphabet mark]					
Numbering	CHE_MAS52225				
Objectives of class					
This course focuses on the synth	etic aspects of po	lymer-supported ch	emistry. Several app	olications of solid-s	upported orga
chemistry will be discussed.					
Contents of class					
(1) Preparation of functionalized n	nonomers				
(2) Preparation method of polyme	r-support				
(3) Preparation of functional polyn	ners by polymer re	action method			
(4) Preparation of functional polyn	ners by polymeriza	tion method			
(5) Nucleophilic reactions on the f					
(6) Electrophhilic reactions on the	functional polyme	rs			
(7) Polymer-supported reagents					
(8) Polymer-supported catalysts					
(9) Asymmetric reaction using pol		atalyst			
(10) Solid phase peptide synthe	sis				
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 polymeri	-	nomers			
<ol> <li>To understand radical polymeri</li> <li>To understand reactions of pol</li> </ol>	ymers				
<ul><li>1)To understand radical polymeri</li><li>2)To understand reactions of pol</li><li>3)To understand the synthesis of</li></ul>	ymers f optically active p	olymers			
<ol> <li>To understand radical polymeri</li> <li>To understand reactions of pol</li> <li>To understand the synthesis of</li> <li>To understand the structure for</li> </ol>	ymers f optically active p	olymers			
1)To understand radical polymeri 2)To understand reactions of pol 3)To understand the synthesis of 4)To understand the structure fo <b>Evaluation of achievement</b>	ymers f optically active p rmation of peptide	olymers s and proteins			
1)To understand radical polymeri 2)To understand reactions of pol 3)To understand the synthesis of 4)To understand the structure fo <b>Evaluation of achievement</b> S:テスト・レポートの合計点(100 g	ymers f optically active p rmation of peptide 点満点)が 90 点以	olymers s and proteins 上			
1)To understand radical polymeri 2)To understand reactions of pol 3)To understand the synthesis of 4)To understand the structure for <b>Evaluation of achievement</b> S:テスト・レポートの合計点(100 A:テスト・レポートの合計点(100 (100 )	ymers optically active p rmation of peptide 点満点)が 90 点以 点満点)が 80 点J	olymers s and proteins 上 以上			
1)To understand radical polymeri 2)To understand reactions of pol 3)To understand the synthesis of 4)To understand the structure for <b>Evaluation of achievement</b> S:テスト・レポートの合計点(100 g A:テスト・レポートの合計点(100 g B:テスト・レポートの合計点(100 g)	ymers optically active p rmation of peptide 気満点)が 90 点以 点満点)が 80 点」 点満点)が 70 点」	olymers s and proteins 上 以上 以上			
1)To understand radical polymeri 2)To understand reactions of pol 3)To understand the synthesis of 4)To understand the structure for <b>Evaluation of achievement</b> S:テスト・レポートの合計点(100 B:テスト・レポートの合計点(100 B:テスト・レポートの合計点(100 C:テスト・レポートの合計点(100	ymers optically active p rmation of peptide 気満点)が 90 点以 点満点)が 80 点」 点満点)が 70 点」 点満点)が 60 点」	olymers s and proteins 上 以上 以上			
1)To understand radical polymeri 2)To understand reactions of pol 3)To understand the synthesis of 4)To understand the structure for <b>Evaluation of achievement</b> S:テスト・レポートの合計点(100 g A:テスト・レポートの合計点(100 B:テスト・レポートの合計点(100 C:テスト・レポートの合計点(100 C:テスト・レポートの合計点(100 S: 90 or higher (out of 100 points)	ymers optically active p rmation of peptide 点満点)が 90 点以 点満点)が 80 点」 点満点)が 70 点」 点満点)が 60 点」	olymers s and proteins 上 以上 以上			
1)To understand radical polymeri 2)To understand reactions of pol 3)To understand the synthesis of 4)To understand the structure for <b>Evaluation of achievement</b> S:テスト・レポートの合計点(100 g A:テスト・レポートの合計点(100 B:テスト・レポートの合計点(100 C:テスト・レポートの合計点(100 S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points)	ymers optically active p rmation of peptide 点満点)が 90 点以 点満点)が 80 点」 点満点)が 70 点」 点満点)が 60 点」	olymers s and proteins 上 以上 以上			
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1)To understand radical polymeri 2)To understand reactions of pol 3)To understand the synthesis of 4)To understand the structure for <b>Evaluation of achievement</b> S:テスト・レポートの合計点(100 g A:テスト・レポートの合計点(100 C:テスト・レポートの合計点(100 C:テスト・レポートの合計点(100 S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) <b>Examination</b>	ymers optically active p rmation of peptide 点満点)が 90 点以 点満点)が 80 点」 点満点)が 70 点」 点満点)が 60 点」	olymers s and proteins 上 以上 以上			

B-502 6813 itsuno@chem.tut.ac.jp

B-403 6812 haraguchi@chem.tut.ac.jp

#### **Reference URL**

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

Office hours

Any time

Relations to attainment objectives of learning and education

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

#### Key words

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

# (M44630080)Advanced Polymer Engineering[Advanced Polymer Engineering]

Subject name[English]	Advanced Polyme	r Engineer	ing[Adva	nced Polymer Engin	eering]	
Schedule number	M44630080	Subject a	area	Advanced	Required or	Elective
				Applied	elective	
				Chemistry and		
	I	<u> </u>		Life Science		
Time of starting a course	Fall2 term	Day o week,per		Tue.2~2	Credit(s)	1
Faculty	Graduate Program	n for Maste	er's Degre	ee	Subject grade	1~
Department Offered	Applied Chemistry	y and Life \$	Science		Beggining grade	M1
Charge teacher name[Roman	吉田 絵里 YOSH	IIDA Eri			8	
alphabet mark]						
Numbering	CHE_MAS52215					
Objectives of class						
1. To acquire knowledge of a	؛ dvanced polymer	svntheses	including	e well-controlled r	olvmerizations and	d heterogeneous
polymerizations in supercritical ca		.,				
2. To understand molecular self-a		d in vitro.				
Contents of class						
1. Advanced polymer syntheses						
1) Controlled radical polymerization	on 1					
2) Controlled radical polymerization	on 2					
3) Molecular design through living		ion				
4) Heterogeneous polymerizations	3					
5) Polymerization in supercritical	carbon dioxide					
2. Molecular self-assembly						
1) Theory of molecular self-asser	nbly in vitro					
2) Theory of molecular self-asser	nbly in vivo					
3) Supramolecular chemistry						
Self Preparation and Review						
Related subjects						
-						
Notes for textbook						
No textbook is needed.						
Notes for reference						
Outle to be achieved						
Goals to be achieved		-defined	lumoro			
To understand cutting-edge tech Evaluation of achievement	nology based on we	II-defined p	polymers	·		
Report assignment						
Examination						
Examination レポートで実施						
レホートで美施 By Report						
Dy Report Details of examination						
Other information						
Reference URL						
Office hours						
Available at anytime						
Relations to attainment objective	s of learning and ea	ducation				

# Key words

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

### (M44630300)Applied Environmental Biology[Applied Environmental Biology]

	vironmental Bi					
Subject name[English]	Applied Envi	ronmental Biology[A	pplied Environmer	ntal Biology]		
nameլEnglisnj Schedule number	M44630300		Subject area	Advanced Applied Chemistry and	Required or elective	Elective
Time of starting a course	Fall1 term		Day of the week,period	Life Science Fri.2~2	Credit(s)	1
Faculty	Graduate Pro	ogram for Master's D			Subject	1~
					grade	
Department Offered	Applied Cher	mistry and Life Scier	nce		Beggining grade	M1
Charge teacher name[Roman alphabet mark]	中鉢 淳 NA	KABACHI Atsushi				
Numbering	CHE_MAS52	225				
The aim of this cou environmental/agricultu The aim of this cou environmental/agricultu	ıral sciences. rse is to lea					
1st week:Biodiversity a 2nd week:Prokaryotic g 3rd week:Plant-microb 5th week:Agricultural p 6th week:Integrated pe 7th week:Genetically m 8th week:Summary 1st week:Biodiversity a 2nd week:Prokaryotic g 3rd week:Plant-microb 5th week:Agricultural p 6th week:Integrated pe 7th week:Genetically m	genomes e interactions eests and disea est managemen nodified crops and evolution genomes e interactions wests and disea est managemen	t ses				
8th week:Summary						
Self Preparation and R No preparation is requi No preparation is requi Related subjects N/A N/A N/A Notes for textbook No textbooks are require	red, but after c red, but after c red.		uts is highly reco		ISBN	978- 0815344643
Self Preparation and R No preparation is requi No preparation is requi Related subjects N/A N/A Notes for textbook No textbooks are requi No textbooks are requi	red, but after c red, but after c red. red.	lass review of hando	uts is highly reco		ISBN Publish year	
Self Preparation and R No preparation is requir No preparation is requir Related subjects N/A N/A Notes for textbook No textbooks are requir No textbooks are require	red, but after c red, but after c red. Book title	lass review of hando	uts is highly reco	mmended.		0815344643

						0879696849
	Author	Nicholas H.	Publisher	Cold Spring	Publish year	2007
		Barton et al.		Harbor		
				Laboratory		
				Press		
Reference3	Book title	Plant Physiology			ISBN	978-
		,,				0878935659
	Author	Lincoln Taiz,	Publisher	Sinauer	Publish year	2010
		Eduardo Zeiger		Associates Inc.	, abiion you	
Notes for reference		Eddardo Eolgoi		/ 1000010000 1110.		
N/A						
N/A						
Goals to be achieved						
		an and biadivantation				
(1) Understand the cor		=				
(2) Can explain how ge		-				
(3) Can tell the differer	-		otic genomes.			
(4) Know various biolog						
(5) Know important agr	-					
(6) Understand the cor						
(7) Understand the tec	nnology for dev	eloping genetically m	odified crops.			
<ol><li>Understand the cor</li></ol>	-					
(2) Can explain how ge	nomes are anal	yzed.				
(3) Can tell the differer	nce between pr	okaryotic and eukary	otic genomes.			
(4) Know various biolog	gical interaction	IS.				
(5) Know important agr	icultural pests	and diseases.				
(6) Understand the cor	ncept of integra	ted pest managemen	t.			
(7) Understand the tec	hnology for dev	eloping genetically m	odified crops.			
Evaluation of achieven	nent					
Achievements are eval		s/term papers				
Grade: Score range						
S: 90-100						
A: 80-89						
B: 70-79						
C: 60-69						
0.00 03						
		<i>.</i>				
Achievements are eval	uated by essay	s/term papers.				
Grade: Score range						
S: 90-100						
A: 80-89						
B: 70-79						
C: 60-69						
Examination						
レポートで実施						
By Report						
Details of examination						
N/A						
N/A						
Other information						
N/A						
N/A						
Reference URL						
Reference URL						
N/A						
N/A						
N/A N/A						
N/A N/A Office hours						
N/A N/A <b>Office hours</b> Emails are welcome.						
N/A N/A Office hours	t objectives of	learning and education	o <b>n</b>			

(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るグローバルな感性を持ち、人間と自然との共生、公共の福祉について考える能 力を身につけている。 (C)高度な知識を統合的に活用できる実践力・創造力 応用化学・生命工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践 的・創造的能力を身につけている。 (C1) 応用化学・生命工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につ けている。 (D1) 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・発信し, コミュニケーショ ンする能力を身につけている。 (E)最新の技術や社会環境の変化に対する探究心と持続的学習力 社会,環境,技術等の変化に対応して,生涯にわたって自発的に計画し学習する能力を身につけている。 Graduate Program of Applied Chemistry and Life Science for Master's Degree (A) Personality and outlook with a broad perspective Have a mindset to see human society from various angles with a global perspective; and the ability to consider the symbiosis between humans and nature as well as public welfare (C) Practical and creative skills to utilize advanced knowledge in an integrated manner Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilizesuch knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner

(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, environment and technology

#### Key words

応用化学·生命工学専攻

evolution, biodiversity, genomes, biological interactions, agriculture

evolution, biodiversity, genomes, biological interactions, agriculture

# (M44630350)Environmental Fluid Dynamics[Environmental Fluid Dynamics]

Subject name[English]	Environmental Fl	uid Dynamics[Enviro	nmental Fluid Dyna	mics]	
Schedule number	M44630350	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Elective
Time of starting a course	Fall2 term	Day of the week,period	Mon.2~2	Credit(s)	1
Faculty	Graduate Program	n for Master's Degr	ee	Subject grade	1~
Department Offered	Applied Chemistr	y and Life Science		Beggining grade	M1
Charge teacher name[Roman alphabet mark]	東海林 孝幸 TO	KAIRIN Takayuki			
Numbering	CHE_MAS54225				
<b>Objectives of class</b> This course mainly focus on env the motion of atmosphere can be This course mainly focus on env the motion of atmosphere can be	e expressed by basi ironmental fluid suc	c physics laws (cons ch as the Earth's at	ervation laws, therr mosphere. The aim	nodynamics of fluid of the course is to	). understand ho
1st: Introduction 2nd: Basic conservation laws (1) 3rd: Basic conservation laws (2) 4th: Thermodynamics of atmosph 5th: Circulation and vorticity equ 6th: Energy equation 7th: Hamiltonian system in contir 8th: Conclusion 1st: Introduction 2nd: Basic conservation laws (1) 3rd: Basic conservation laws (2) 4th: Thermodynamics of atmosph 5th: Circulation and vorticity equ 6th: Energy equation 7th: Hamiltonian system in contir 8th: Conclusion Self Preparation and Review Related subjects Math (differential equation, vector Math (differential equation, vector Notes for textbook The lecturer distributes handouts	ation nuum mechanics nere ation nuum mechanics r analysis etc), phy r analysis etc), phy s.				
The lecturer distributes handout: Notes for reference	S.				
			ndamental fluid dvn	amics. We will main	ly focus on
	•				,, , , , , , , , , , , , , , , , , , , ,
•thermodynamics of atmosphere	momentum and ene	rgy for atmosphere. eric motion using fu		amics. We will main	
This course aims to understand to the conservation laws of mass, thermodynamics of atmosphere circulation, vorticity equation This course aims to understand to the conservation laws of mass, thermodynamics of atmosphere	momentum and ene	rgy for atmosphere. eric motion using fu		amics. We will main	
This course aims to understand to the conservation laws of mass, thermodynamics of atmosphere circulation, vorticity equation This course aims to understand to the conservation laws of mass, thermodynamics of atmosphere circulation, vorticity equation	momentum and ene the Earth's atmosph momentum and ene	rgy for atmosphere. heric motion using fu rgy for atmosphere.	ndamental fluid dyn	amics. We will main	

A: Total points obtained from attendance and report, 80 or higher (out of 100 points).

B: Total points obtained from attendance and report, 70 or higher (out of 100 points).

C: Total points obtained from attendance and report, 60 or higher (out of 100 points).

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

S: Total points obtained from attendance and report, 90 or higher (out of 100 points).

A: Total points obtained from attendance and report, 80 or higher (out of 100 points).

B: Total points obtained from attendance and report, 70 or higher (out of 100 points).

C: Total points obtained from attendance and report, 60 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@ace.tut.ac.jp Room #G-405, tokairin@ace.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

(E)最新の技術や社会環境の変化に対する探究心と持続的学習力 社会,環境,技術等の変化に対応して,生涯にわたって自発的に計画し学習する能力を身につけている。

(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, environment and technology

Key words

## (M44630430)Advanced Molecular Design Chemistry 1[Advanced Molecular Design Chemistry 1]

Subject name[English]	Advanced Molecu	ılar Design Chemistr	y 1[Advanced Mole	cular Design Chem	istry 1]
Schedule number	M44630430	Subject area	Advanced Applied Chemistry and Life Science	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 Degre	e	Subject grade	1~
Department Offered	Applied Chemistr	y and Life Science		Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S4系教務委員 4	kei kyomu Iin−S			
Numbering	CHE_MAS53225				
Objectives of class This course will provide the stude design chemistry. Contents of class The classes will be given by his/ contents of this course depend of	her supervisor. The	e students will be re			
Self Preparation and Review					
Related subjects					
Advanced Molecular Design Chem	nistry 2				
Notes for textbook					
Supervisor will recommend textbo	ooks and papers to	students.			
Notes for reference					
Goals to be achieved					
	on advanced moleci	ular design chemistr	y.		
Goals to be achieved To acquire advanced knowledge of To be able to report and discuss					
To acquire advanced knowledge o					
To acquire advanced knowledge o					
To acquire advanced knowledge on To be able to report and discuss	the contents of tex	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge c To be able to report and discuss Evaluation of achievement	the contents of tex	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss Evaluation of achievement The evaluation is based on the so	the contents of tex cores of reports, pro- scores.	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss <b>Evaluation of achievement</b> The evaluation is based on the so His/her supervisor evaluates the	the contents of tex cores of reports, pro- scores. ),	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss a <b>Evaluation of achievement</b> The evaluation is based on the so His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points)	the contents of tex cores of reports, pro- scores. ), ), ),	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss <b>Evaluation of achievement</b> The evaluation is based on the so His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points)	the contents of tex cores of reports, pro- scores. ), ), ),	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss a <b>Evaluation of achievement</b> The evaluation is based on the so His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) <b>Examination</b>	the contents of tex cores of reports, pro- scores. ), ), ),	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss a <b>Evaluation of achievement</b> The evaluation is based on the so His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points)	the contents of tex cores of reports, pro- scores. ), ), ),	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss <b>Evaluation of achievement</b> The evaluation is based on the so His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) <b>Examination</b> 試験期間中には何も行わない None during exam period	the contents of tex cores of reports, pro- scores. ), ), ),	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss Evaluation of achievement The evaluation is based on the so His/her supervisor evaluates the S: 90 or higher (out of 100 points A: 80 or higher (out of 100 points B: 70 or higher (out of 100 points C: 60 or higher (out of 100 points Examination 試験期間中には何も行わない	the contents of tex cores of reports, pro- scores. ), ), ),	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss <b>Evaluation of achievement</b> The evaluation is based on the so His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) Examination 試験期間中には何も行わない None during exam period Details of examination	the contents of tex cores of reports, pro- scores. ), ), ),	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss Evaluation of achievement The evaluation is based on the so His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) Examination 試験期間中には何も行わない None during exam period Details of examination	the contents of tex cores of reports, pro- scores. ), ), ),	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss <b>Evaluation of achievement</b> The evaluation is based on the so His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) Examination 試験期間中には何も行わない None during exam period Details of examination Supervisor Reference URL	the contents of tex cores of reports, pro- scores. ), ), ),	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss <b>Evaluation of achievement</b> The evaluation is based on the so His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) <b>Examination</b> 試験期間中には何も行わない None during exam period <b>Details of examination</b> <b>Other information</b> Supervisor	the contents of tex cores of reports, pro- scores. ), ), ),	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss of <b>Evaluation of achievement</b> The evaluation is based on the sod His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) 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://chem.tut.ac.jp/en/	the contents of tex cores of reports, pro- scores. ), ), ), )	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss <b>Evaluation of achievement</b> The evaluation is based on the so His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) Examination 試験期間中には何も行わない None during exam period Details of examination Supervisor Reference URL http://chem.tut.ac.jp/en/ Office hours	the contents of tex cores of reports, pro- scores. ), ), ) ) ) ) by appointment.	tbooks and papers l	ne∕she has read.		
To acquire advanced knowledge of To be able to report and discuss <b>Evaluation of achievement</b> The evaluation is based on the soc His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) Examination Tisto during exam period Details of examination Other information Supervisor Reference URL http://chem.tut.ac.jp/en/ Office hours Students are encouraged visiting	the contents of tex cores of reports, pro- scores. ), ), ), ) ) <u>by appointment.</u> <b>by appointment.</b> <b>is of learning and e</b> t applied chemistry	tbooks and papers l esentations, and exa ducation quation	grated manner as well as related	fields; and have t	the practical an

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

## Key words

# (M44630450)Advanced Molecular Functional Chemistry 1[Advanced Molecular Functional Chemistry 1]

Subject name[English]		lar Functional Chem	-		-
Schedule number	M44630450	Subject area	Advanced Applied Chemistry and Life Science	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 Degre	e	Subject grade	1~
Department Offered	Applied Chemistr	y and Life Science		Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S4系教務委員 4	kei kyomu Iin−S		Biddo	
Numbering	CHE_MAS52225				
Objectives of class This course will provide the stude functional chemistry. Contents of class The classes will be given by his∕ contents of this course depend o	her supervisor. The	e students will be re			
Self Preparation and Review					
Related subjects					
Advanced Molecular Functional C	hemistry 2				
Notes for textbook					
Supervisor will recommend textbo	ooks and papers to	students.			
Notes for reference					
To acquire advanced knowledge of To be able to report and discuss Evaluation of achievement The evaluation is based on the so His/her supervisor evaluates the S: 90 or higher (out of 100 points A: 80 or higher (out of 100 points B: 70 or higher (out of 100 points C: 60 or higher (out of 100 points Examination 試験期間中には何も行わない None during exam period Details of examination	the contents of tex ores of reports, pros scores. ), ),	tbooks and papers l	ne∕she has read.		
Other information					
Supervisor					
Reference URL http://chem.tut.ac.jp/en/					
Office hours					
Students are encouraged visiting Relations to attainment objective		ducation			
(C) Practical and creative skills to Have advanced knowledge about creative skills to utilize such know (C1) Have the skills to voluntarily related fields; and to utilize such	applied chemistry vledge for problem v acquire theories	y and life science solving in an integra and applied knowled	as well as related ted manner		

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

## Key words

## (M44630470)Advanced Molecular Biological Chemistry 1[Advanced Molecular Biological Chemistry 1]

Schedule number		_	-	olecular Biological	-
	M44630470	Subject area	Advanced Applied Chemistry and Life Science	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 Degre	e	Subject grade	1~
Department Offered	Applied Chemistry	y and Life Science		Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S4系教務委員 4	kei kyomu Iin−S			
Numbering	CHE_MAS52225				
Objectives of class This course will provide the stude biological chemistry. Contents of class The classes will be given by his/I contents of this course depend or	her supervisor. The	e students will be re			
Self Preparation and Review	· · ·				
Related subjects					
Advanced Molecular Biological Ch	emistry 2				
Notes for textbook	-				
Supervisor will recommend textbo	oks and papers to	students.			
<b>Goals to be achieved</b> To acquire advanced knowledge o To be able to report and discuss t					
To acquire advanced knowledge o To be able to report and discuss the <b>Evaluation of achievement</b> The evaluation is based on the sc His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) <b>Examination</b> 試験期間中には何も行わない	the contents of tex ores of reports, pre scores. , ,	tbooks and papers I	ne∕she has read.		
To acquire advanced knowledge o To be able to report and discuss the <b>Evaluation of achievement</b> The evaluation is based on the sc His/her supervisor evaluates the sc S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) <b>Examination</b> 武験期間中には何も行わない None during exam period Details of examination	the contents of tex ores of reports, pre scores. , ,	tbooks and papers I	ne∕she has read.		
To acquire advanced knowledge o To be able to report and discuss the <b>Evaluation of achievement</b> The evaluation is based on the sc His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) <b>Examination</b> 試験期間中には何も行わない None during exam period <b>Details of examination</b> <b>Other information</b> Supervisor	the contents of tex ores of reports, pre scores. , ,	tbooks and papers I	ne∕she has read.		
To acquire advanced knowledge o To be able to report and discuss to Evaluation of achievement The evaluation is based on the sc His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) Examination 試験期間中には何も行わない None during exam period Details of examination Supervisor Reference URL	the contents of tex ores of reports, pre scores. , ,	tbooks and papers I	ne∕she has read.		
To acquire advanced knowledge o To be able to report and discuss the <b>Evaluation of achievement</b> The evaluation is based on the sc His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) <b>Examination</b> 試験期間中には何も行わない None during exam period <b>Details of examination</b> <b>Other information</b> Supervisor <b>Reference URL</b> http://chem.tut.ac.jp/en/	the contents of tex ores of reports, pre scores. , ,	tbooks and papers I	ne∕she has read.		
To acquire advanced knowledge o To be able to report and discuss the Evaluation of achievement The evaluation is based on the sc His/her supervisor evaluates the sc His/her supervisor evaluates the sc S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) Examination Stise期間中には何も行わない None during exam period Details of examination Other information Supervisor Reference URL http://chem.tut.ac.jp/en/ Office hours	the contents of tex ores of reports, pre scores. ), ), )	tbooks and papers I	ne∕she has read.		
To acquire advanced knowledge o To be able to report and discuss the <b>Evaluation of achievement</b> The evaluation is based on the sc His/her supervisor evaluates the S: 90 or higher (out of 100 points) A: 80 or higher (out of 100 points) B: 70 or higher (out of 100 points) C: 60 or higher (out of 100 points) <b>Examination</b> 試験期間中には何も行わない None during exam period <b>Details of examination</b> <b>Other information</b> Supervisor <b>Reference URL</b> http://chem.tut.ac.jp/en/	the contents of tex ores of reports, pre scores. ), ), ) ) ) by appointment.	tbooks and papers I	ne∕she has read.		

(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment

Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

## 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]		rchitecture and Civ	ILSE	eminar on Archite	ecture and Givil
	Engineering I]		1		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	-	d Civil Engineering		Beggining	M1
				grade	
Charge teacher name[Roman	S5系教務委員:	5kei kvomu lin-S		8.000	
alphabet mark]					
Numbering	ARC_MAS51015				
	AI(0_101A331013				
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					
Self Preparation and Review					
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					
Relations to attainment objective	s of learning and	education			
1					
Key words					
Key words					

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

Outlinet mentel[Englink]	C			·····	
Subject name[English]	-	rchitecture and Civ	II Engineering IILS	eminar on Archit	ecture and Givil
<u> </u>	Engineering II	<b></b>		<b>_</b>	- · ·
Schedule number	M45610020	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	am for Master's Degre	ee	Subject grade	2~
Department Offered	_	d Civil Engineering		Beggining	M2
Dopardinente errereu				grade	
Charge teacher name[Roman	05 云	5kei kyomu Iin-S		grado	
	30宋秋伤女員	Jker kyönnu im-3			
alphabet mark]					
Numbering	ARC_MAS61015	)			
Objectives of class					
All the students are required to	attend all the se	minars, which is arrar	nged by the laborate	ory supervisor for	the special study
subjects related to the current re	esearch activity o	f the laboratory. The	scheduled program	of the seminars is	announced by the
supervisor at the guidance of the		,			,
Contents of class					
Self Preparation and Review					
Related subjects					
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					
Relations to attainment objective	s of learning and	education			
Key werde					
Key words					

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

Subject name[English]		n on Architecture and	_				
	Civil Engineering	-		nesis nesearen on			
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	Credit(s)	6			
Faculty	Graduate Progra	am for Master's Degre	e	Subject grade	1~1		
Department Offered	Architecture an	d Civil Engineering		Beggining grade	M1, M2		
Charge teacher name[Roman alphabet mark]	S5系教務委員,	S5系教務委員, 5系各教員 5kei kyomu Iin−S, 5kei kakukyouin					
Numbering	ARC MAS61015						
Objectives of class	-						
This thesis research on architect	ture and civil engi	neering is designated	to deepen the know	wledge and enhanc	e the skills of the		
students in their research fields t							
Contents of class	5						
The subjects and the contents o	of the thesis vary	depending on the la	boratory. All studen	its must present t	neir thesis at the		
end of the course and take a fir	al examination or	the thesis, as a req	uirement for the gr	aduation of the ma	ster course. The		
study for the thesis is planned ar	nd conducted unde	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	5.			
Examination この曲							
その他 Other							
Details of examination							
Other information							
Refer to administration office.							
Reference URL							
Refer to the URL of each laborat	ory						
Office hours							
Refer to administration office.							
Relations to attainment objective	as of learning and	education					
Key words							

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

Subject name[English]	Thesis Research	on Architecture and	Civil Engineering	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	Credit(s)	6	
Faculty	Graduate Progra	m for Master's Degre	ee	Subject grade	1~
Department Offered	Architecture and	d Civil Engineering		Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S5系教務委員,	5系各教員 5kei kyo	mu Iin−S, 5kei kakuk	youin	
Numbering	ARC_MAS61015				
Objectives of class					
This thesis research on architec	ure and civil engir	neering is designated	to deepen the know	wledge and enhanc	e the skills of the
students in their research fields t	hrough the self-o	riented endeavour wi	th the instruction of	f his/her superviso	r(s).
Contents of class					
The subjects and the contents o	of the thesis vary	depending on the la	boratory. All studer	its must present t	heir thesis at the
end of the course and take a fir				aduation of the ma	aster course. The
study for the thesis is planned ar	id conducted unde	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 pi	reparation and prese	ntation of the thesis	5.	
<b>Examination</b> その他					
신 Other					
Details of examination					
Other information					
Refer to administration office.					
Reference URL	0.127				
Refer to the URL of each laborat Office hours	ory				
Refer to administration office.					
Relations to attainment objective	s of learning and	education			
	s. isaning and				
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[T	hesis 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	n for Master's Degre	e	Subject grade	2~
Department Offered	Architecture and	Civil Engineering		Beggining	M2
				grade	
Charge teacher name[Roman	S5系教務委員, 5	5系各教員 5kei kyor	nu Iin−S, 5kei kakuk	youin	
alphabet mark]					
Numbering	ARC_MAS61015				
Objectives of class					
This thesis research on architect	ure and civil engine	eering is designated	to deepen the know	wledge and enhanc	e the skills of the
students in their research fields t	hrough the self-ori	ented endeavour wi	th the instruction of	f his/her superviso	r(s).
Contents of class					
The subjects and the contents o	of the thesis vary o	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	nd conducted under	the guidance of the	supervisor(s).		
Self Preparation and Review					
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 pre	eparation and preser	ntation of the thesis	5.	
Examination	· · · ·	· · · · · ·			
試験期間中には何も行わない					
None during exam period					
Details of examination					
Other information					
Refer to administration office.					
Reference URL					
Refer to the URL of each laborat	orv				
Office hours	,				
Refer to administration office.					
Relations to attainment objective	s of learning and e	ducation			
Key words					

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

Subject nemo[English]	Saminan an Ar	rchitecture and Ci	uil En ain a anim a lo a	ningu on Aughita	atuma and Civil
Subject name[English]		rchilecture and G		minar on Archite	cture and Givii
	Engineering	0.1	A 1 1	D	D : 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 Degre	ee	Subject grade	2~
Department Offered	Architecture and	Civil Engineering		Beggining	M2
				grade	
Charge teacher name[Roman	S5系教務委員5	ōkei kyomu Iin−S			
alphabet mark]					
Numbering	ARC MAS51015				
Objectives of class	_				
-	attand all the ear	ainara which is array	and by the laborat	ny our on loor for	the energial study
All the students are required to					
subjects related to the current re		the laboratory. The	scheduled program	of the seminars is a	announced by the
supervisor at the guidance of the	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	nt and/or those of o	ther departments.		
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation 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	es of learning and o	education			
Key words					

# (M45630010)Elasticity and Stability[Elasticity and Stability]

name[English]	Elasticity an	d Stability[Elasticity	and Stability]			
Schedule number	M45630010		Subject area	Advanced Architecture and Civil	Required or elective	Elective
				Engineering		
Time of starting a	Fall term		Day of the	Tue.3~3	Credit(s)	2
course		<b>6 M</b> + 7	week,period		<u>.</u>	
Faculty	Graduate Pr	ogram for Master's I	Jegree		Subject grade	1~
Department Offered	Architecture	e and Civil Engineerir	ıg		Beggining	M1
Charge teacher	松本 幸大	MATSUMOTO Yukih	iro		grade	
name[Roman						
alphabet mark]						
Numbering	ARC_MAS54	1325				
Objectives of class						
Ist – 6th week; Mecha Fensor Analysis in Car Stresses and Equilibric Strain-Displacement F Constitutive Equations 7th – 11th week; Mech Drthotropic material	rtesian Coordir um Relations s in Isotropic E	nates lastic Materials	naterial			
Mixturing rule						
Laminate theory 12th – 15th week; Ela	astic buckling o	of bars and plates				
	nics of elastic	ity				
1st – 6th week; Mecha		-				
1st – 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu	rtesian Coordir ım	-				
1st – 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain-Displacement F	rtesian Coordir um Relations	nates				
1st – 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain-Displacement F Constitutive Equations	rtesian Coordir um Relations s in Isotropic E	nates lastic Materials				
1st – 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain-Displacement F Constitutive Equations 7th – 11th week; Mech	rtesian Coordir um Relations s in Isotropic E	nates lastic Materials	naterial			
1st – 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain–Displacement F Constitutive Equations 7th – 11th week; Mech Orthotropic material	rtesian Coordir um Relations s in Isotropic E	nates lastic Materials	naterial			
1st – 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain-Displacement F Constitutive Equations 7th – 11th week; Mech Orthotropic material Mixturing rule	rtesian Coordir um Relations s in Isotropic E	nates lastic Materials	naterial			
1st – 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain-Displacement F Constitutive Equations 7th – 11th week; Mech Orthotropic material Mixturing rule Laminate theory	rtesian Coordir um Relations s in Isotropic E nanics of elasti	nates lastic Materials city for composite m	naterial			
1st – 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain-Displacement F Constitutive Equations 7th – 11th week; Mech Orthotropic material Mixturing rule Laminate theory	rtesian Coordir um Relations s in Isotropic E nanics of elasti	nates lastic Materials city for composite m	naterial			
1st – 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain–Displacement F Constitutive Equations 7th – 11th week; Mech Orthotropic material Mixturing rule Laminate theory 12th – 15th week; Ela	rtesian Coordir um Relations s in Isotropic E nanics of elasti astic buckling o	nates lastic Materials city for composite m	naterial			
1st – 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain–Displacement F Constitutive Equations 7th – 11th week; Mech Orthotropic material Mixturing rule Laminate theory 12th – 15th week; Ela	rtesian Coordir um Relations s in Isotropic E nanics of elasti astic buckling o	nates lastic Materials city for composite m	naterial			
1st - 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain-Displacement F Constitutive Equations 7th - 11th week; Mech Orthotropic material Mixturing rule Laminate theory 12th - 15th week; Ela <b>Self Preparation and F</b>	rtesian Coordir um Relations s in Isotropic E nanics of elasti astic buckling o	nates lastic Materials city for composite m	naterial			
1st - 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain-Displacement F Constitutive Equations 7th - 11th week; Mech Orthotropic material Mixturing rule Laminate theory 12th - 15th week; Ela <b>Self Preparation and F</b>	rtesian Coordir um Relations s in Isotropic E nanics of elasti astic buckling o	nates lastic Materials city for composite m	naterial			
1st - 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain-Displacement F Constitutive Equations 7th - 11th week; Mech Orthotropic material Mixturing rule Laminate theory 12th - 15th week; Ela <b>Self Preparation and F</b>	rtesian Coordir um Relations s in Isotropic E nanics of elasti astic buckling o	nates lastic Materials city for composite m	naterial			
1st – 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain–Displacement F Constitutive Equations 7th – 11th week; Mech Orthotropic material Mixturing rule Laminate theory 12th – 15th week; Ela <b>Self Preparation and F</b> Related subjects	rtesian Coordir um Relations s in Isotropic E nanics of elasti astic buckling o	nates lastic Materials city for composite m	naterial			
1st – 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain–Displacement F Constitutive Equations 7th – 11th week; Mech Orthotropic material Mixturing rule Laminate theory 12th – 15th week; Ela <b>Self Preparation and F</b> Related subjects Notes for textbook	rtesian Coordir um Relations s in Isotropic E nanics of elasti astic buckling o	nates lastic Materials city for composite m	naterial			
1st – 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain–Displacement F Constitutive Equations 7th – 11th week; Mech Orthotropic material Mixturing rule Laminate theory 12th – 15th week; Ela <b>Self Preparation and F</b> Related subjects Notes for textbook Some handouts will be	rtesian Coordir um Relations s in Isotropic E nanics of elasti astic buckling o Review	nates lastic Materials city for composite m	naterial			
1st – 6th week; Mecha Tensor Analysis in Car Stresses and Equilibriu Strain-Displacement F Constitutive Equations 7th – 11th week; Mech Orthotropic material Mixturing rule Laminate theory 12th – 15th week; Ela Self Preparation and F Related subjects Notes for textbook Some handouts will be Some handouts will be Reference1	rtesian Coordir um Relations s in Isotropic E nanics of elasti astic buckling o Review	nates lastic Materials city for composite m			ISBN	978- 0070858206

	Book title	Theory of Elastic S	Stability	ISBN	978-	
			1		0486472072	
	Author	S. Timoshenko	Publisher	Dover	Publish	2009
				Publications	year	
Reference3	Book title	Mechanics of Com	posite Materials		ISBN	978-
					0486442396	
	Author	Richard M.	Publisher	Dover	Publish	2005
		Christensen		Publications	year	
Notes for reference						
Goals to be achieved	d					
The primary purpos	e is to encoura	age students to gain	the fundamenta	al concept and to	raise their po	tential abilities f
advanced and practic	cal applications i	n the future.		·	·	
The primary purpos	e is to encoura	age students to gain	the fundamenta	al concept and to	raise their po	tential abilities f
advanced and practic	cal applications i	n the future.				
Evaluation of achiev	ement					
Based on reports						
Based on reports						
Examination						
レポートで実施						
By Report						
Details of examination	on					
Other information						
Reference URL						
	t.ac.jp/					
http://www.st.ace.tu						
http://www.st.ace.tu http://sel.ace.tut.ac.	jp/y-matsum/					
http://sel.ace.tut.ac.	t.ac.jp/					
http://sel.ace.tut.ac. http://www.st.ace.tu	t.ac.jp/					
http://sel.ace.tut.ac. http://www.st.ace.tu http://sel.ace.tut.ac.	t.ac.jp/ jp/y-matsum/					

# (M45630090)Coastal Hydraulics[Coastal Hydraulics]

Subject name[English]	Coastal Hydraulics[Coa	stal Hydrau	lics					
Schedule number	M45630090		Subject are		ture and	Required or elective	Electiv	ve
Time of starting a course	Fall term		Day of t week.period	he Thu.2~		Credit(s)	2	
Faculty	Graduate Program for M	laster's De		·		Subject grade	1~	
Department Offered	Architecture and Civil E	ngineering				Beggining grade	M1	
Charge teacher name[Roman alphabet mark]	加藤 茂 KATO Shigeru							
Numbering	ARC_MAS54325							
Objectives of class								
including numerical calcu To understand the basic	concept of coastal engir	-		-		-	-	
including numerical calcu	ulation.							
Contents of class								
	ic knowledge of hydraulic	s						
2th week, Basic knowled	-							
3th week, Small amplitud	le wave theory (1)							
4th week, Small amplitud	de wave theory (2)							
5th week, Wave motion								
6th week, Wave energy a	and transformation (1)							
7th week, Wave energy a	and transformation (2)							
8th week, Review and ex	kercise							
9th week, Long-period w	vave (1)							
10th week, Long-period	wave (2)							
11th week, Statistical pr	operty of wave (1)							
12th week, Statistical pr	operty of wave (2)							
13nd week, Sediment tra	ansport							
14th week, Bathymetric	change in shallow water i	region						
15th week, Review and e	-	0						
16th week, Term-end ex								
	ic knowledge of hydraulic	s						
2th week, Basic knowled		5						
3th week, Small amplitud								
4th week, Small amplitud								
5th week, Wave motion	a wave theory (Z)							
6th week, Wave motion	and transformation $(1)$							
7th week, Wave energy a								
8th week, Review and ex								
9th week, Long-period w								
10th week, Long-period								
11th week, Statistical pr								
12th week, Statistical pr 12th week, Statistical pr								
13nd week. Sediment tra	•	region						
13nd week, Sediment tra 14th week, Bathymetric	change in shallow water i	-9.011						
14th week, Bathymetric								
14th week, Bathymetric 15th week, Review and e	exercise							
14th week, Bathymetric 15th week, Review and e 16th week, Term-end ex	exercise amination							
14th week, Bathymetric 15th week, Review and e 16th week, Term-end ex Self Preparation and Re	exercise xamination <b>view</b>	oftor the -			the distant	butod bandarit	and /a	0.07-
14th week, Bathymetric 15th week, Review and e 16th week, Term-end ex Self Preparation and Re Self preparation before	exercise amination	after the c	lass are ne	cessary using	the distr	buted handout	and/or	som
14th week, Bathymetric 15th week, Review and e 16th week, Term-end ex Self Preparation and Re Self preparation before references.	exercise (amination view the class and review (							
14th week, Bathymetric 15th week, Review and e 16th week, Term-end ex Self Preparation and Re Self preparation before references.	exercise xamination <b>view</b>							

Basic knowledge of coastal engineering is desirable.

Basic knowledge of coastal engineering is desirable.

# Notes for textbook

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			nics for Enginee n Ocean Enginee	ISBN		
	Author	Robert G. Dea	an &	Publisher	World Scientific	Publish year	
		Robert	Α				
		Dalrymple					
Reference2	Book title	Introduction t	o Coa	astal Engineering	and Management -	ISBN	
		Advanced Ser	ies or				
	Author	J. Wi	liam	Publisher	World Scientific	Publish year	
		Kamphuis					
Reference3	Book title	Basic Coastal	Engir	ISBN			
	Author	Robert	М.	Publisher	Kluwer Academic	Publish year	
		Sorensen			Publishers		

# Goals to be achieved

Understanding the concept and methodology for coastal engineering.

Understanding the concept and methodology for coastal engineering.

### Evaluation of achievement

Reports & attendance & Examination

Reports(30%) & attendance(10%) & Examination(60%)

Students are required to attend essentially all classes, and to submit all assignments for evaluation.

More than four classes of absence are not allowed for evaluation.

Evaluation is based on total points (out of 100 points) of reports (30%) and class attendance (10%) and examination (60%). Grade, S: 90 or higher, A: 80 or higher to lower than 90, B: 70 or higher to lower than 80, C: 60 or higher to lower than 70.

# Examination

定期試験を実施(対面)

# Examination(Face to Face)

Details of examination

# N/A

N/A

## Other information

Room : D-812 E-mail : s-kato@ace.tut.ac.jp.

Room : D-812

E-mail : s-kato@ace.tut.ac.jp.

# Reference URL

N/A

# N/A

Office hours At any time.

But please ask me the visit time in advance.

At any time.

## But please ask me the visit time in advance.

Relations to attainment objectives of learning and education N/A

N/A

(C)高度な知識を統合的に活用できる実践力・創造力
 建築・都市システム学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践
 的・創造的能力を身につけている。
 (C1)建築・都市システム学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。
 N/A

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner

Have advanced knowledge about architecture and civil engineering as well as related fields; and have the practical and creative skills to utilizesuch knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about architecture and civil engineering as well as related fields; and to utilize such knowledge in an integrated manner

### Key words

Sediment transport, Current, Waves, Shore protection and management

Sediment transport, Current, Waves, Shore protection and management

(M45630190)Advanced Structura	l System Planning	and Design I[Advand	ced Structural Syste	em Planning and D	esign I]
Subject name[English]	Advanced Struct and Design I]	tural System Plannii	ng and Design I[Ad	vanced Structural	System Planning
Schedule number	M45630190	Subject area	Advanced	Required or	Elective
			Architecture	elective	
			and Civil		
			Engineering		
Time of starting a course	Fall term	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Progra	m for Master's Degre	e	Subject grade	1~
Department Offered	Architecture and	l Civil Engineering		Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S5系教務委員 5	ōkei kyomu Iin−S			
Numbering	ARC_MAS51025				
Objectives of class					
It depends on the laboratory. T	The resistered stu	dents are required	to attend all the s	eminars which is	arranged by the
laboratory supervisor for the spe		-			
program of the seminars is annou					y. The solication
Contents of class	anced by the super	visor at the guiudhot			
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	es of learning and e	education			
Key words					

(M45630210)Advanced Environm	ental System Plann	ning and [	Desig	n I[Ad	vanced Environmen	tal System Plannin	g and Design I]
Subject name[English]	Advanced Enviro Planning and Des	_	Syste	em Pl	anning and Design	I[Advanced Enviro	onmental System
Schedule number	M45630210	Subjec	t area	a	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Fall term	Day week,p	of eriod	the	Intensive	Credit(s)	2
Faculty	Graduate Program				e	Subject grade	1~
Department Offered	Architecture and Civil Engineering Beggining M1 grade						M1
Charge teacher name[Roman alphabet mark]	S5系教務委員 5	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 <b>Contents of class</b>	ecial study subjects	s related	to th	e curi	rent research activi		
Self Preparation and Review							
Related subjects							
Notes for textbook							
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	es of learning and e	ducation					
Key words							
L							

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

Subject name[English]	Advanced Regional System Planning and Design I[Advanced Regional System Planning and							
	Design I]							
Schedule number	M45630230	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 Progra	am for Master's Degre	ee	Subject grade	1~			
Department Offered	Architecture an	d Civil Engineering	Beggining grade	M1				
Charge teacher name[Roman	S5系教務委員 5kei kyomu lin−S							
alphabet mark]								
Numbering	ARC_MAS51025							
Objectives of class								
It depends on the laboratory. T								
laboratory supervisor for the spe				ty of the laborator	y. The scheduled			
program of the seminars is annou	inced by the supe	rvisor at the guidance	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								

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

Subject name[English]	Seismic Design o	f Structures	Seismi	c Design of Structur	es]				
Schedule number	M45630290	Subject ar		Advanced	Required or	Elective			
		Subject are	- 4	Architecture	elective	_1000110			
				and Civil	000040				
Time of starting a course	Fall term	Day of	the	Engineering Fri.2~2	Credit(s)	2			
Timo of starting a Course		week,perio		1 (1.2 ° - 2		2			
Faculty	Graduate Program	Graduate Program for Master's Degree				1~			
Department Offered	Architecture and		-		Subject grade Beggining	M1			
Dopartmone Onorou			grade						
Charge teacher name[Roman	齊藤 大樹 SAIT	OH Taiki			8.000				
alphabet mark]									
Numbering	ARC MAS51025								
Objectives of class									
The objective of this class is to	learn the evaluat	tion method	of stri	ictural performance	of the building b	ased on dynamic			
behavior and ultimate strength ar			01 344		of the building be				
The objective of this class is to	-	-	of stri	ictural performance	of the building b	ased on dynamic			
behavior and ultimate strength ar					Junding De	and aynamic			
Contents of class									
1. Basic concept of seismic desig	n of building								
2. Force-deformation characteris	-	erials							
3. Seismic evaluation method for	-								
3-1. Screening method 1	streams buildings								
3–2. Screening method 2									
4. Post-seismic quick risk assess	ment of damaged h	uilding							
		Janang							
1 Desir concept of existing desired									
1. Basic concept of seismic design of building									
2. Force-deformation characteristics of building materials									
3. Seismic evaluation method for existing buildings									
3-1. Screening method 1									
3-2. Screening method 2									
4. Post-seismic quick risk assessment of damaged building									
Self Preparation and Review									
Related subjects									
None									
None									
Notes for textbook									
Notes for reference									
Goals to be achieved									
	hrough learning the	e seismic eva	luation	method of structure	al member and build	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									
Examination									
レポートで実施									
Dバートで実施 By Report									
Details of examination									
Oth an information									
Professor Taiki Saito (D805), e-mail: tsaito@ace.tut.ac.jp (Room: D-805)									
Professor Taiki Saito (D805), 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