

Syllabus

**International Master' s Degree
Program
(2016-Spring Term)**

(M40030010)Management Science[Management Science]

Subject name[English]	Management Science[Management Science]				
Schedule number	M40030010	Subject area	General courses	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Thu.1~1	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Common			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	藤原 孝男 FUJIWARA Takao				
Numbering					
Objectives of class					
Study objective is to learn an analytical capability on social and economical perspectives. This class introduces basic finance knowledge to understand the managerial idea and tool for the company value and capital cost. Teaching language is mainly dependent on English.					
Contents of class					
The class will disucss about basic ideas about the option valuation based on the elementary probabiity, interest rate, and arbitrage. Class content will include following topics: #1: baic probability, #2: normal probability variable, #3: geometric Brownian motion, #4: interest rates, #5: arbitrage trade, #6~7: Black Scholes formula, #8~10: additional items: dividend, jump, and volatility estimation, #11: valuation by expected utility, #12: stochastic order, #13: optimization model, #14: stochastic dynamic programming, #15: exotic option, #16: semester examination.					
Self Preparation and Review					
Teaching materials will be uploaded at moodle. Attending students are expected to complete pre- and re-views, investigate by themselves, and ask the lecturer.					
Related subjects					
Management (undergraduate), Operations Management, Real Options, Game Theory, MOT, Entrepreneurship, Innovation Managemen					
Notes for textbook					
As noted above, materials will be uploaded at moodle.					
Reference1	Book title	An Elementary Introduction to Mathematical Finance (3rd.ed.)		ISBN	978-0-521-19253-8
	Author	Sheldon M. Ross	Publisher	Cambridge University Press	Publish year 2011 年
Notes for reference					
Goals to be achieved					
1) To understand the meaning of normal random variable. 2) To comprehend the basic model structure of Black Scholes formula. 3) To value an European call option.					

Evaluation of achievement

Evaluation Style:

Evaluation weight allocation is planned as Semester Examination 60% and Reports 40%.

Evaluation Criteria:

A: If students achieved every above goals and their summed scores are equal or more than 80 (the maxim scores 100).

B: If students achieved at least 65% of above goals and their summed scores are equal or more than 80 (the maxim scores 100).

C: If students achieved at least 55% of above goals and their summed scores are equal or more than 55 (the maxim scores 100).

Examination

その他

Examination(Face to Face)

Details of examination**Other information****Reference URL****Office hours**

At any time if available.

Relations to attainment objectives of learning and education**Key words**

Real Options, Game Theory, Operations Management, Management

(M40030020)Industrial Policies[Industrial Policies]

Subject name[English]	Industrial Policies[Industrial Policies]				
Schedule number	M40030020	Subject area	General courses	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Thu.5~5	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Common			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	渋澤 博幸 SHIBUSAWA Hiroyuki				
Numbering					
Objectives of class					
In this course, students learn the fundamental of input-output analysis and the industrial policy evaluation methodology. In this course, students learn the fundamental of input-output analysis and the industrial policy evaluation methodology.					
Contents of class					
1: Introduction and Overview 2-6:Input-Output Analysis at the National Level 7-8: Numerical Examples and Case Studies at the National Level 9-13:Input-Output Analysis at the Regional Level 14-15: Numerical Examples and Case Studies at the Regional Level					
1: Introduction and Overview 2-6:Input-Output Analysis at the National Level 7-8: Numerical Examples and Case Studies at the National Level 9-13:Input-Output Analysis at the Regional Level 14-15: Numerical Examples and Case Studies at the Regional Level					
Self Preparation and Review					
Related subjects					
Economics, Policy, Simulation Economics, Policy, Simulation					
Notes for textbook					
Papers will be distributed.					
Reference: Miller and Blair, Input-Output Analysis(Second Edition), Cambridge University Press, 2009					
Papers(resume) will be distributed.					
Reference: Miller and Blair, Input-Output Analysis(Second Edition), Cambridge University Press, 2009					
Reference1	Book title	Input-Output Analysis(Second Edition)		ISBN	978-0-521-73902
	Author	Miller and Blair	Publisher	Cambridge University Press	Publish year 2009
Notes for reference					
Goals to be achieved					
Acquiring the knowledge of the advanced Input-Output analysis Acquiring the knowledge of the advanced Economic Simulation Methods					
Acquiring the knowledge of the advanced Input-Output analysis Acquiring the knowledge of the advanced economic simulation methods					

Evaluation of achievement

Test(50%)+Report(50%)=100%

A: 80 Points or higher, B:65 points or higher, C:55 points or higher, D: Less than 55 points

Course Evaluation

Evaluation is based primarily on examinations (50 points) and reports (50points), totally 100 points. A: Total points of exam and reports, 80 or higher (out of 100 points).

B: Total points of exam and reports, 65 or higher (out of 100 points).

C: Total points of exam and reports, 55 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**

Room: B-409

Tel:6963

E-mail:hiro-shibu@tut.jp

Room: B-409

Tel:6963

E-mail:hiro-shibu@tut.jp

Reference URL

www.pm.ace.tut.ac.jp

www.pm.ace.tut.ac.jp

Office hours

Wednesday 9:00-10:00

Wednesday 9:00-10:00

Relations to attainment objectives of learning and education**Key words**

Industrial Policy, Economics, Simulation

Industrial Policy, Economics, Simulation

(M40030050)Japanese Life Today[Japanese Life Today]

Subject name[English]	Japanese Life Today[Japanese Life Today]				
Schedule number	M40030050	Subject area	General courses	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Fri.1~1	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Common			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S総合一教務委員, 藤原 孝男, Lim Pang Boey, 寺嶋 一彦, 大門 裕之, 井佐原 均, 穂積直裕, 齊藤 大樹, 岩佐 精二, 福本 昌宏, 高嶋 孝明, 加藤 三保子, 鈴木 新一, 池松 峰男, 武藤 浩行, 伊藤 公毅 Sougou kyoiku kyomu Iin, FUJIWARA Takao, Lim Pang Boey, TERASHIMA Kazuhiko, DAIMON Hiroyuki, ISAHARA Hitoshi, HOZUMI Naohiro, SAITOH Taiki, IWASA Seiji, FUKUMOTO Masahiro, TAKASHIMA Takaaki, KATOH Mihoko, SUZUKI Shinichi, IKEMATSU Mineo, MUTO Hiroyuki, ITO Koki				
Numbering					
Objectives of class	In this series of lectures, the excellent experts of our university from different areas will impart to the engineering students highly interesting insider knowledge. The participants will get to know Japan of today from technical, economic and social viewpoints.				
Contents of class	<p>1. Lim Pang Boey “Japanese Education System” Learn about the Japanese education system and what the life of a student is like in Japan?</p> <p>2. Daimon “Working in Japanese Company” Learn and discuss about working in Japanese company and what you should do for it.</p> <p>3. Terashima “Robot in Japan” Robot is very popular in Japan. Especially, industry robot is number one all over the world. The year of 1980 is said to be the first year of robotics in Japan. Since then, Japanese robot has been extremely developed. In this lecture, history of robotics development and state of art in robot is lectured.</p> <p>4. Iwasa “The Range of Organic Chemistry” I will give a talk on the following subjects as one of scene of science and technology in Japan: ◆Organic Chemistry in Environment —Amazing Natural Products— ◆Development of Life Environment —Molecular Sensor as a Basic Technology in all of Science— ◆New Horizon of Catalytic Asymmetric Synthesis —C1 Asymmetric Catalyst—</p> <p>5. Isahara “Computer and Japanese” Japanese language is very much different from other languages. Problems caused by such differences during computer processing of Japanese are discussed in this lecture.</p> <p>6. Hozumi “Japan’s Modernization Supported by Electric Power” Japan’s modernization started in the middle of 19 th centry when a long period of isolation policy has been terminated. Her repid growth until now has been strongly supported by electric power. Now Japan’s power supply is recognized as the best quality in the world. In the lecture, history and state of the art of Japan’s electric power will be presented.</p> <p>7. Saito “Earthquake safety of buildings in Japan” The purpose of this lecture is to understand the history of earthquake disasters in Japan and lessons learned from those disasters for the safety of buildings.</p> <p>8. Muto “Fine Ceramics” Fine Ceramics (also known as “advanced ceramics”) are used to make components that require high levels of performance and reliability, such as advanced electronic devices and so on. In fact, Fine Ceramics support the latest technologies in diverse applications throughout modern society. In this class, students will learn about “manufacture (Mono-zukuri)” in Japan.</p> <p>9. Fukumoto “Introduction of advanced surface modification and welding technology in Japan” Two advanced materials processing will be introduced. One is on the surface modification technology based on the particles</p>				

deposition. Thermal spray, Cold spray and Aero-sol deposition will be explained. Another is on the welding technology based on the friction stirring. Fundamental aspects on FSW will be given in the lecture.

10. Takashima & Fujiwara “A global company doing business in Japan”

IBM, a global enterprise, is running business in Japan more than 75 years. A history and transformation of IBM's business in Japan are introduced. A comparative analysis of IBM with TOYOTA is provided to see and think about the differences. An insight that the lecturer got from the experience of working in IBM for 32 years is also shared.

11. Fujiwara “Japaneses-style Business Management”

Since 1980s, Japanese management style has become popular in automobile, electrical, and electronics industries in terms of employment, promotion, and industrial relations for quality control and skill transfer. We will discuss its advantages and disadvantages.

12. Ito “Progress in pure mathematics in Japan”

In this lecture, we focus on the progress in pure mathematics in Japan after World War II; especially we give a brief introduction to

1. the work done by Kunihiko Kodaira, who is the first Japanese mathematician awarded to Fields Medal, and
2. algebraic analysis, promoted strongly by Japanese mathematicians (e.g. Mike Sato, Kazuhiko Aomoto, etc.)

13. Kato “Japanese culture and their mind”

This lecture will provide students with an opportunity to become familiar with Japanese culture and its artifacts as well as an understanding of the differences between Japan and other countries. Students will be expected to demonstrate knowledge of the way Japanese people think or act and their cultural heritage.

14. Ikematsu “Water Pollution History”

Japan has overcome lots of pollution incidents first in the world on her way to industrialization. Ashio Mining Pollution in 1878 was the first among various cases including Itai-Itai disease and Minamata disease. In the class, students are expected to learn about Japan's water pollution history and view the world's current environmental issues through the window of it.

15. Suzuki “Relativity, Energy and Japan”

Energy is one of the biggest issues for Japan. The class reviews the origin of the concept of nuclear energy and the relation between nuclear energy and Japan.

Self Preparation and Review

Related subjects

N/A

Notes for textbook

Notes for reference

Goals to be achieved

- 1) To understand a variety of Japanese cultural, social, and engineering perspectives.
- 2) To evaluate and criticize Japanese characteristics from interdisciplinary viewpoints.
- 3) To discuss and write global understanding.

Evaluation of achievement

Evaluation method: scoring will be proceeded by sum of each report evaluation.

Evaluation criteria:

Students who attend all classes will be evaluated as follows:

- A: Achieved all goals and obtained total points of exam and reports, 80 or higher (out of 100 points).
B: Achieved 65 % of goals and obtained total points of exam and reports, 65 or higher (out of 100 points).
C: Achieved 55 % of goals and obtained total points of exam and reports, 55 or higher (out of 100 points).

Examination

その他

By Report

Details of examination

Other information

Reference URL

Office hours

After each class.

Relations to attainment objectives of learning and education

Key words

Japan, Japanese, Culture, Religion, Politics & Economy, Technology

(M40030060)Intercultural Communication[Intercultural Communication]

Subject name[English]	Intercultural Communication[Intercultural Communication]				
Schedule number	M40030060	Subject area	General courses	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Mon.2~2	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Common			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	村松 由起子 MURAMATSU Yukiko				
Numbering					
Objectives of class					
This is a Basic Japanese conversation class. You will learn elementary Japanese grammar to speak Japanese on campus. This is a Basic Japanese conversation class. You will learn elementary Japanese grammar to speak Japanese on campus.					
Contents of class					
Students will learn the following lessons in Japanese textbook “ Basic Japanese for Students Hakase1”.					
<ol style="list-style-type: none"> 1. Pronunciation of Japanese 2. Lesson 1 Hajimemashite. Watashi wa Heren desu. 3. Lesson 2 O-kuni wa dochira desuka. 4. Lesson 3 Sore wa nan desuka. 5. Lesson 4 Watashi wa asa koohii o nomimasu. 6. Lesson 5 Ima nan-ji desuka. 7. Lesson 6 Ashita doko e ikimasu ka. 8. Lesson 7 Juu-gatsu juu-go-nichi ni Nihon e kimashita. 9. Lesson 8 Kyooshitsu ni dare ga imasu ka. 10.Lesson 9 Yuubinkyoku wa doko ni arimasu ka. 11.Lesson 10 Nihon e robotto no kenkyuu ni kimashita. 12.Lesson 11 Fuji-san wa kireina yama desu. 13.Lesson 12 Ryokoo wa doo deshita ka. 14.Lesson 13 Shuumatsu ni nani oshitai desu ka. 15.Lesson 14 Ongaku ga suki desu ka. 					
The term examination					
Students will learn the following lessons in Japanese textbook “ Basic Japanese for Students Hakase1”.					
<ol style="list-style-type: none"> 1. Pronunciation of Japanese 2. Lesson 1 Hajimemashite. Watashi wa Heren desu. 3. Lesson 2 O-kuni wa dochira desuka. 4. Lesson 3 Sore wa nan desuka. 5. Lesson 4 Watashi wa asa koohii o nomimasu. 6. Lesson 5 Ima nan-ji desuka. 7. Lesson 6 Ashita doko e ikimasu ka. 8. Lesson 7 Juu-gatsu juu-go-nichi ni Nihon e kimashita. 9. Lesson 8 Kyooshitsu ni dare ga imasu ka. 10.Lesson 9 Yuubinkyoku wa doko ni arimasu ka. 11.Lesson 10 Nihon e robotto no kenkyuu ni kimashita. 12.Lesson 11 Fuji-san wa kireina yama desu. 13.Lesson 12 Ryokoo wa doo deshita ka. 14.Lesson 13 Shuumatsu ni nani oshitai desu ka. 15.Lesson 14 Ongaku ga suki desu ka. 					
The term examination					
Self Preparation and Review					

Preparation: Please read Vocabulary and Notes in each lesson.

Review: Please memorize "Structures" after each lesson.

Preparation: Please read Vocabulary and Notes in each lesson.

Review: Please memorize "Structures" after each lesson.

Related subjects

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

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

Textbook1	Book title	Basic Japanese for Students Hakase 1 (はかせ1)		ISBN	
	Author	Yamazaki yoshiko, mitsuru	Publisher	3A Corporation (スリーエーネット トワーク)	Publish year

Notes for textbook

Notes for reference

Goals to be achieved

You will be able to communicate with Japanese people in easy Japanese.

You will be able to communicate with Japanese people in easy Japanese.

Evaluation of achievement

Homework 40%

The term examination 60%

Homework 40%

The term examination 60%

Examination

定期試験を実施(対面)

Examination(Face to Face)

Details of examination

Other information

Reference URL

Office hours

Tuesday 13:00-13:30

Tuesday 13:00-13:30

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Seminar on Mechanical Engineering I[Seminar on Mechanical Engineering I]				
Schedule number	M41610010	Subject area	Advanced Mechanical Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	4
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			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					
Objectives of class	The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.				
Contents of class	The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.				
Self Preparation and Review					
Related subjects					
Notes for textbook	Textbook or material will be made available from the supervisors.				
Notes for reference					
Goals to be achieved	To acquire fundamental knowledge of individual research fields. To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.				
Evaluation of achievement	Coursework, presentation and/or report.				
Examination	その他 None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Seminar on Mechanical Engineering II[Seminar on Mechanical Engineering II]				
Schedule number	M41610020	Subject area	Advanced Mechanical Engineering	Required or elective	Required
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~
Department Offered	Mechanical Engineering			Beggining grade	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					
Objectives of class	The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.				
Contents of class	The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.				
Self Preparation and Review					
Related subjects					
Notes for textbook	Textbook or material will be made available from the supervisors.				
Notes for reference					
Goals to be achieved	To acquire fundamental knowledge of individual research fields. To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.				
Evaluation of achievement	Coursework, presentation and/or report.				
Examination	その他 None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	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 Program for Master's Degree			Subject grade	1~1
Department Offered	Mechanical Engineering			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					
Objectives of class	The thesis research aims to provide a practical experience of research work, and to acquire research skills with deep understanding of the relevant knowledge.				
Contents of class	The research subject depends on the supervisor and the research group you join. Individual students will have different research subjects. Discuss with your supervisor.				
Self Preparation and Review					
Related subjects					
Notes for textbook	Reference and material will be available from the supervisor.				
Notes for reference					
Goals to be achieved	To get something new on individual research fields. To develop your research skills including planning and presentation skills.				
Evaluation of achievement					
Examination	その他 None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	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 Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			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 kakukyoin				
Numbering					
Objectives of class	The thesis research aims to provide a practical experience of research work, and to acquire research skills with a deep understanding of relevant knowledge.				
Contents of class	The research subject depends on the supervisor and the research group you join. Individual students will have different research subjects. Discuss with your supervisor.				
Self Preparation and Review					
Related subjects					
Notes for textbook	Reference and material will be available from the supervisor.				
Notes for reference					
Goals to be achieved	To get something new on individual research fields. To develop your research skills including planning and presentation skills.				
Evaluation of achievement					
Examination	その他 Other				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Thesis Research on Mechanical Engineering[Thesis Research on Mechanical Engineering]				
Schedule number	M4161003T	Subject area	Advanced Mechanical Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~2
Department Offered	Mechanical Engineering			Beggining grade	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					
Objectives of class	The thesis research aims to provide a practical experience of research work, and to acquire research skills with a deep understanding of relevant knowledge.				
Contents of class	The research subject depends on the supervisor and the research group you join. Individual students will have different research subjects. Discuss with your supervisor.				
Self Preparation and Review					
Related subjects					
Notes for textbook	Reference and material will be available from the supervisor.				
Notes for reference					
Goals to be achieved	To get something new on individual research fields. To develop your research skills including planning and presentation skills.				
Evaluation of achievement					
Examination	その他 Other				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Seminar on Mechanical Engineering[Seminar on Mechanical Engineering]				
Schedule number	M41610040	Subject area	Advanced Mechanical Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Mechanical Engineering			Beggining grade	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					
Objectives of class	The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.				
Contents of class	The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.				
Self Preparation and Review					
Related subjects					
Notes for textbook	Textbook or material will be made available from the supervisors.				
Notes for reference					
Goals to be achieved	To acquire fundamental knowledge of individual research fields. To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.				
Evaluation of achievement	Coursework, presentation and/or report.				
Examination	その他 None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Joining and Surfacing of Materials[Joining and Surfacing of Materials]				
Schedule number	M41630070	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Tue.1~1	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	福本 昌宏 FUKUMOTO Masahiro				
Numbering					
Objectives of class					
To understand fundamentals of advanced technology in materials joining, especially both in high performance thick coating formation by Thermal Spraying, Cold Spraying, Aero-sol Deposition, and in non-melting diffusion bonding by Friction Stir Welding.					
To understand fundamentals of advanced technology in materials joining, especially both in high performance thick coating formation by Thermal Spraying, Cold Spraying, Aero-sol Deposition, and in non-melting diffusion bonding by Friction Stir Welding.					
Contents of class					
<ol style="list-style-type: none"> 1. Fundamental of surface modification process and technology 2. Fundamentals of thermal spray process, Splat formation problem 3. Process control with Transition temperature & Transition pressure 4. Cold spraying and Aero-sol deposition process, Functional materials coating: photocatalyst, SOFC, nano coating, intermetallic compound coating, etc. 5. Fundamental of Friction Stir Welding 6. Joining between disimillar materials by FSW 7.5. Friction spot welding, practical applications of FSW 8. Examination 					
<ol style="list-style-type: none"> 1. Fundamental of surface modification process and technology 2. Fundamentals of thermal spray process, Splat formation problem 3. Process control with Transition temperature & Transition pressure 4. Cold spraying and Aero-sol deposition process, Functional materials coating: photocatalyst, SOFC, nano coating, intermetallic compound coating, etc. 5. Fundamental of Friction Stir Welding 6. Joining between disimillar materials by FSW 7.5. Friction spot welding, practical applications of FSW 8. Examination 					
Self Preparation and Review					
Related subjects					
Basic knowledge on materials joining process is desirable.					
Basic knowledge on materials joining process is desirable.					
Notes for textbook					
Handouts will be prepared for participants.					
(Reference)					
Required readings will be taken from a variety of reference books and research papers.					
Handouts will be prepared for participants.					
(Reference)					
Required readings will be taken from a variety of reference books and research papers.					
Notes for reference					
Goals to be achieved					

Understand following items,
-Joining mechanism between dissimilar materials
-Features and mechanism of various joining methods
-Features and mechanism of thick and thin film coating
-Features of functionally gradient material and composite material
Understand following items,
-Joining mechanism between dissimilar materials
-Features and mechanism of various joining methods
-Features and mechanism of thick and thin film coating
-Features of functionally gradient material and composite material

Evaluation of achievement

Interim report & presentation (20%) and term-end report (80%).
Interim report & presentation (20%) and term-end report (80%).

Examination

レポートで実施

By Report

Details of examination

Other information

Masahiro Fukumoto:
Room: D-503, ext.: 6692, e-mail: fukumoto@tut.jp
Masahiro Fukumoto:
Room: D-503, ext.: 6692, e-mail: fukumoto@tut.jp

Reference URL

<http://isf.me.tut.ac.jp/>
<http://isf.me.tut.ac.jp/>

Office hours

anytime to e-mail address: fukumoto@tut.jp

anytime to e-mail address: fukumoto@tut.jp

Relations to attainment objectives of learning and education

Key words

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

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

Subject name[English]	Modeling and Analysis of Dynamical Control Systems[Modeling and Analysis of Dynamical Control Systems]				
Schedule number	M41630130	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Thu.2~2	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	寺嶋 一彦 TERASHIMA Kazuhiko				
Numbering					
Objectives of class					
<p>Fundamental thory of Modern control engineering is lectured. First, modeling and identification is introduced, and modern control thory is studied based on nonlinear systems, and LQ control and estmation on observer and Kalman filter is studied. Vibration control with transfer is introduced.</p> <p>Fundamental thory of Modern control engineering is lectured. First, modeling and identification is introduced, and modern control thory is studied based on nonlinear systems, and LQ control and estmation on observer and Kalman filter is studied. Vibration control with transfer is introduced.</p>					
Contents of class					
<p>We provide the following schedule. Because this course is for master students, we can consider the requests from the master students.</p> <p>1st week: Modelling and identification 2nd week: Nonlinear optimal control 3rd week: LQ control 4th week: Observer 5th week: Kalman filter 6th week: Vibration control – Input shaping and Hybrid shape control 7th week: Summary 8th week: Examination (Report)</p> <p>We provide the following schedule. Because this course is for master students, we can consider the requests from the master students.</p> <p>1st week: Modelling and identification 2nd week: Nonlinear optimal control 3rd week: LQ control 4th week: Observer 5th week: Kalman filter 6th week: Vibration control – Input shaping and Hybrid shape control 7th week: Summary 8th week: Examination (Report)</p>					
Self Preparation and Review					
Related subjects					
<p>Fundamentals of linear algebra, differential equation, mechanics, measurement and control theory, and robotics. Fundamentals of linear algebra, differential equation, mechanics, measurement and control theory, and robotics.</p>					
Notes for textbook					
<p>Handouts will be prepared.</p> <p>Reference: Applied Nonlinear Control: Jean-Jacques E.Slotine, Weiping Li;Prentice Hall International Inc.(1991) Handouts will be prepared.</p>					

Reference:

Applied Nonlinear Control: Jean-Jacques E.Slotine, Weiping Li;Prentice Hall International Inc.(1991)

Notes for reference

Goals to be achieved

- (1) Understand Analysis methods of Nonlinear Dynamical Systems
- (2) Understand Modeling and identification
- (3) Understand Optimal control
- (4) Understand LQ control
- (5) Understand Estimation – observer and Kalman filter –

- (1) Understand Analysis methods of Nonlinear Dynamical Systems
- (2) Understand Modeling and identification
- (3) Understand Optimal control
- (4) Understand LQ control
- (5) Understand Estimation – observer and Kalman filter –

Evaluation of achievement

Report (100 %)

- A: Score of the report is 80 or higher.
B: Score of the report is 65 or higher.
C: Score of the report is 55 or higher.

Report (100 %)

- A: Score of the report is 80 or higher.
B: Score of the report is 65 or higher.
C: Score of the report is 55 or higher.

Examination

レポートで実施

By Report

Details of examination

Other information

Tel. 0532-44-6699

E-mail: terasima@me.tut.ac.jp

Tel. 0532-44-6699

E-mail: terasima@me.tut.ac.jp

Reference URL

Students who are interesting with nonlinear systems and control are welcome.

Basic control theory and mathematical knowledge are required.

Students who are interesting with nonlinear systems and control are welcome.

Basic control theory and mathematical knowledge are required.

Office hours

Thursday 4-6pm (Terashima D-510)

Thursday 4-6pm (Terashima D-510)

Relations to attainment objectives of learning and education

(D1) Ability for solving problems with expertise

(D1) Ability for solving problems with expertise

Key words

Optimal control, LQ control, Observer, Kalman filter, Vibration control

Optimal control, LQ control, Observer, Kalman filter, Vibration control

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

Subject name[English]	Advanced Mechanical Systems Design II[Advanced Mechanical Systems Design II]				
Schedule number	M41630220	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Mon.4~4	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering					
Objectives of class	The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.				
Contents of class	The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.				
Self Preparation and Review					
Related subjects					
Notes for textbook	Textbook or material will be made available from the supervisors.				
Notes for reference					
Goals to be achieved	To acquire fundamental knowledge of individual research fields. To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.				
Evaluation of achievement	Coursework, presentation and/or report.				
Examination	その他 None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Advanced Materials and Manufacturing Process II[Advanced Materials and Manufacturing Process II]				
Schedule number	M41630240	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Tue.4~4	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering					
Objectives of class	This lecture aims to provide a broad understanding of the materials and manufacturing process available for the master thesis research work of a student.				
Contents of class	The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.				
Self Preparation and Review					
Related subjects					
Notes for textbook	Textbook or material will be made available from the supervisors.				
Notes for reference					
Goals to be achieved	To acquire fundamental knowledge of individual research fields. To acquire the ability to find problems, the ability to solve the problems and the presentation skill.				
Evaluation of achievement	Coursework, presentation and/or report.				
Examination	その他 None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Advanced System, Control and Robotics II[Advanced System, Control and Robotics II]				
Schedule number	M41630260	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Thu.4~4	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering					
Objectives of class	This lecture aims to provide a broad understanding of the control and robotics available for the master thesis research work of a student.				
Contents of class	The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.				
Self Preparation and Review					
Related subjects					
Notes for textbook	Textbook or material will be made available from the supervisors.				
Notes for reference					
Goals to be achieved	To acquire fundamental knowledge of individual research fields. To acquire the ability to find problems, the ability to solve the problems and the presentation skill.				
Evaluation of achievement	Coursework, presentation and/or report.				
Examination	その他 None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Advanced Energy and Environmental Engineering II[Advanced Energy and Environmental Engineering II]				
Schedule number	M41630280	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Fri.4~4	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Begging grade	M1, M2
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering					
Objectives of class	This lecture aims to provide a broad understanding of the energy and environmental engineering available for the master thesis research work of a student.				
Contents of class	The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.				
Self Preparation and Review					
Related subjects					
Notes for textbook	Textbook or material will be made available from the supervisors.				
Notes for reference					
Goals to be achieved	To acquire fundamental knowledge of individual research fields. To acquire the ability to find problems, the ability to solve the problems and the presentation skill.				
Evaluation of achievement	Coursework, presentation and/or report.				
Examination	その他 None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(M41630310)Vibration Engineering[Vibration Engineering]

Subject name[English]	Vibration Engineering[Vibration Engineering]				
Schedule number	M41630310	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Tue.2~2	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	河村 庄造 KAWAMURA Shozo				
Numbering					
Objectives of class					
This lecture will provide the knowledge of modal analysis method and component mode synthesis method to treat a huge degree of freedom system. This lecture will provide the knowledge of modal analysis method and component mode synthesis method to treat a huge degree of freedom system.					
Contents of class					
Modal analysis for multi degree of freedom system 1: Introduction of modal analysis, undamped system 2: A system with proportional viscous damping (1) 3: A system with proportional viscous damping (2) 4: Compensate of higher vibration modes					
Component mode synthesis method 5: Formulation of sub-systems 6: Modal synthesis using constraint modes (1) 7: Modal synthesis using constraint modes (2) 8: Modal synthesis using non-constraint modes					
Modal analysis for multi degree of freedom system 1: Introduction of modal analysis, undamped system 2: A system with proportional viscous damping (1) 3: A system with proportional viscous damping (2) 4: Compensate of higher vibration modes					
Component mode synthesis method 5: Formulation of sub-systems 6: Modal synthesis using constraint modes (1) 7: Modal synthesis using constraint modes (2) 8: Modal synthesis using non-constraint modes					
Self Preparation and Review					
Self-preparation and review are necessary. Self-preparation and review are necessary.					
Related subjects					
Dynamics, Vibration engineering, Mechanical vibration Dynamics, Vibration engineering, Mechanical vibration					
Notes for textbook					
Handouts will be prepared (download by yourself) Handouts will be prepared (download by yourself)					
Notes for reference					
Goals to be achieved					
(1) Understand the modal analysis for multi degree of freedom system (2) Understand the component mode synthesis method (1) Understand the modal analysis for multi degree of freedom system (2) Understand the component mode synthesis method					
Evaluation of achievement					
Method: report (full score 100).					

Level: achievement in the case upper 55 points.
Level A: upper 80 points, Level B: upper 65 points, Level C: upper 55 points
Method: report (full score 100).
Level: achievement in the case upper 55 points.
Level A: upper 80 points, Level B: upper 65 points, Level C: upper 55 points

Examination

レポートで実施
By Report

Details of examination

Other information

Contact person: Prof. Shozo Kawamura E-Mail:kawamura@me.tut.ac.jp
Contact person: Prof. Shozo Kawamura E-Mail:kawamura@me.tut.ac.jp

Reference URL

Office hours

Ask by E-mail.
Ask by E-mail.

Relations to attainment objectives of learning and education

(D) 広範囲の知識を有機的に連携させた研究開発方法論の体得
広範囲の知識の連携による研究開発に係る方法論を体得し、研究開発の設計立案と実践能力

Key words

Modal analysis, Component mode synthesis method
Modal analysis, Component mode synthesis method

(M41630360)Modeling and Analysis of Dynamical Control Systems[Modeling and Analysis of Dynamical Control Systems]

Subject name[English]	Modeling and Analysis of Dynamical Control Systems[Modeling and Analysis of Dynamical Control Systems]				
Schedule number	M41630360	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Thu.2~2	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Mechanical Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	寺嶋 一彦 TERASHIMA Kazuhiko				
Numbering					
Objectives of class					
<p>Fundamental thory of Modern control engineering is lectured. First, modeling and identification is introduced, and modern control thory is studied based on nonlinear systems, and LQ control and estmation on observer and Kalman filter is studied. Vibration control with transfer is introduced.</p> <p>Fundamental thory of Modern control engineering is lectured. First, modeling and identification is introduced, and modern control thory is studied based on nonlinear systems, and LQ control and estmation on observer and Kalman filter is studied. Vibration control with transfer is introduced.</p>					
Contents of class					
<p>We provide the following schedule. Because this course is for master students, we can consider the requests from the master students.</p> <p>1st week: Modelling and identification 2nd week: Nonlinear optimal control 3rd week: LQ control 4th week: Observer 5th week: Kalman filter 6th week: Vibration control – Input shaping and Hybrid shape control 7th week: Summary 8th week: Examination (Report)</p> <p>We provide the following schedule. Because this course is for master students, we can consider the requests from the master students.</p> <p>1st week: Modelling and identification 2nd week: Nonlinear optimal control 3rd week: LQ control 4th week: Observer 5th week: Kalman filter 6th week: Vibration control – Input shaping and Hybrid shape control 7th week: Summary 8th week: Examination (Report)</p>					
Self Preparation and Review					
Related subjects					
<p>Fundamentals of linear algebra, differential equation, mechanics, measurement and control theory, and robotics. Fundamentals of linear algebra, differential equation, mechanics, measurement and control theory, and robotics.</p>					
Notes for textbook					
<p>Handouts will be prepared.</p> <p>Reference: Applied Nonlinear Control: Jean-Jacques E.Slotine, Weiping Li;Prentice Hall International Inc.(1991)</p>					

Handouts will be prepared.

Reference:

Applied Nonlinear Control: Jean-Jacques E.Slotine, Weiping Li;Prentice Hall International Inc.(1991)

Notes for reference

Goals to be achieved

- (1) Understand Analysis methods of Nonlinear Dynamical Systems
- (2) Understand Modeling and identification
- (3) Understand Optimal control
- (4) Understand LQ control
- (5) Understand Estimation – observer and Kalman filter –

- (1) Understand Analysis methods of Nonlinear Dynamical Systems
- (2) Understand Modeling and identification
- (3) Understand Optimal control
- (4) Understand LQ control
- (5) Understand Estimation – observer and Kalman filter –

Evaluation of achievement

Report (100 %)

- A: Score of the report is 80 or higher.
 - B: Score of the report is 65 or higher.
 - C: Score of the report is 55 or higher.
- Report (100 %)

- A: Score of the report is 80 or higher.
- B: Score of the report is 65 or higher.
- C: Score of the report is 55 or higher.

Examination

レポートで実施
By Report

Details of examination

Other information

Tel. 0532-44-6699
E-mail: terasima@me.tut.ac.jp
Tel. 0532-44-6699
E-mail: terasima@me.tut.ac.jp

Reference URL

Students who are interesting with nonlinear systems and control are welcome.
Basic control theory and mathematical knowledge are required.
Students who are interesting with nonlinear systems and control are welcome.
Basic control theory and mathematical knowledge are required.

Office hours

Thursday 4-6pm (Terashima D-510)
Thursday 4-6pm (Terashima D-510)

Relations to attainment objectives of learning and education

- (D1) Ability for solving problems with expertise
- (D1) Ability for solving problems with expertise

Key words

Optimal control, LQ control, Observer, Kalman filter, Vibration control
Optimal control, LQ control, Observer, Kalman filter, Vibration 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 Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]				
Schedule number	M42610020	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~2
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S2系教務委員, 2系各教員 2kei kyomu Iin-S, 2kei kakukyoin				
Numbering					
Objectives of class					
The thesis research aims to provide a practical experience of research work, and to acquire his/her research skill with deep understanding of the electrical and electronic information engineering.					
Contents of class					
The research subject depends on the supervisor and the research group you belong to. Every student will have an individual research subject. For more details, please contact with your supervisor.					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Reference and material will be available from the supervisor.					
Notes for reference					
Goals to be achieved					
To get something new on individual research fields. To develop his/her research skill including the planning and the presentation.					
Evaluation of achievement					
Presentation, Thesis,Coursework, and Outcomes are evaluated generally.					
Examination					
その他 None during exam period					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]				
Schedule number	M42610020	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S2系教務委員, 2系各教員 2kei kyomu Iin-S, 2kei kakukyoin				
Numbering					
Objectives of class					
The thesis research aims to provide a practical experience of research work, and to acquire his/her research skill with deep understanding of the electrical and electronic information engineering.					
Contents of class					
The research subject depends on the supervisor and the research group you belong to. Every student will have an individual research subject. For more details, please contact with your supervisor.					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Reference and material will be available from the supervisor.					
Notes for reference					
Goals to be achieved					
To get something new on individual research fields. To develop his/her research skill including the planning and the presentation.					
Evaluation of achievement					
Presentation, Thesis, Coursework, and Outcomes are evaluated generally.					
Examination					
その他 None during exam period					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]				
Schedule number	M4261002T	Subject area	Advanced 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 Program for Master's Degree			Subject grade	2~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S2系教務委員, 2系各教員 2kei kyomu Iin-S, 2kei kakukyoin				
Numbering					
Objectives of class					
The thesis research aims to provide a practical experience of research work, and to acquire his/her research skill with deep understanding of the electrical and electronic information engineering.					
Contents of class					
The research subject depends on the supervisor and the research group you belong to. Every student will have an individual research subject. For more details, please contact with your supervisor.					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Reference and material will be available from the supervisor.					
Notes for reference					
Goals to be achieved					
To get something new on individual research fields. To develop his/her research skill including the planning and the presentation.					
Evaluation of achievement					
Presentation, Thesis, Coursework, and Outcomes are evaluated generally.					
Examination					
その他 None during exam period					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Seminar on Electrical and Electronic Information Engineering[Seminar on Electrical and Electronic Information Engineering]				
Schedule number	M42610040	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 Program for Master's Degree			Subject grade	2~2
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S2系教務委員, 2系各教員 2kei kyomu Iin-S, 2kei kakukyouin				
Numbering					
Objectives of class					
The seminar aims to provide a broad understanding of theoretical and experimental approaches related to the electrical and electronic information engineering for the research work of his/her master thesis.					
Contents of class					
The class provides both of fundamental knowledge on the research work of master thesis and the most advanced results in the related field by reading research papers and monographs. Contents of the class depend on the supervisor. To be announced by individual supervisors.					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Textbook or material will be made available from the supervisor. To be announced by individual supervisors.					
Notes for reference					
Goals to be achieved					
To acquire fundamental knowledge on individual research fields. To acquire the ability of finding a problem, the ability of solving the problem and the presentation skill.					
Evaluation of achievement					
Coursework, presentation and/or report.					
Examination					
その他 None during exam period					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Seminar on Electrical and Electronic Information Engineering 1A[Seminar on Electrical and Electronic Information Engineering 1A]				
Schedule number	M42610050	Subject area	Advanced 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 Program for Master's Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S2系教務委員, 2系各教員 2kei kyomu Iin-S, 2kei kakukyoin				
Numbering					
Objectives of class					
The seminar aims to provide a broad understanding of theoretical and experimental approaches related to the electrical and electronic information engineering for the research work of his/her master thesis.					
Contents of class					
The class provides both of fundamental knowledge on the research work of master thesis and the most advanced results in the related field by reading research papers and monographs. Contents of the class depend on the supervisor. To be announced by individual supervisors.					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Textbook or material will be made available from the supervisor. To be announced by individual supervisors.					
Notes for reference					
Goals to be achieved					
To acquire fundamental knowledge on individual research fields. To acquire the ability of finding a problem, the ability of solving the problem and the presentation skill.					
Evaluation of achievement					
Coursework, presentation and/or report.					
Examination					
その他 None during exam period					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(M42630110)Methodology of R & D 2[Methodology of R & D 2]

Subject name[English]	Methodology of R & D 2[Methodology of R & D 2]				
Schedule number	M42630110	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Tue.3~3	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
Numbering					
Objectives of class	The class aims to provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis.				
Contents of class	The class provides some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors				
Self Preparation and Review					
Related subjects					
Notes for textbook	Reference and material will be available from the supervisor.				
Notes for reference					
Goals to be achieved	To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes.				
Evaluation of achievement	Coursework and presentation are evaluated generally.				
Examination	その他 None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(M42630150)Physics for Electronics 2[Physics for Electronics 2]

Subject name[English]	Physics for Electronics 2[Physics for Electronics 2]				
Schedule number	M42630150	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Wed.2~2	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	松田 厚範, 服部 敏明, 石山 武, 高木 宏幸 MATSUDA Atsunori, HATTORI Toshiaki, ISHIYAMA Takeshi, TAKAGI Hiroyuki				
Numbering					
Objectives of class					
Objectives of this subject are to understand the fundamental aspects on functional materials, photonics, electroductics, spin electronics, and also to have overall knowledge on the latest technologies on these physical phenomena.					
Objectives of this subject are to understand the fundamental aspects on functional materials, photonics, electroductics, spin electronics, and also to have overall knowledge on the latest technologies on these physical phenomena.					
Contents of class					
"Physics for Electronics 1" is composed of four topics of functional materials, photonics, electroductics, and spin electronics, which will be delivered for three times for each by four professors whose expertise lie on the individual categories.					
The category of "Functional materials" is made to learn preparation, characterization and applications of functional materials for electronics and ionics based on physics and chemistry. The contents are 1) Fundamentals of amorphous and crystal, 2) Structure and property of glasses, 3) New preparation techniques of advanced materials, 4) Functional materials for ionics including Li-ion battery and fuel cell, and 5) Functional materials for optics including coatings, micro-optical components, and photonic devices.					
The category of "electroductics" is electrochemical reaction on electrode. The contents are 1) fundamentals of thermodynamics in aqueous solution, 2) fundamental of electrical double layer 3) fundamental of adsorption, 4) fundamentals of electrochemical reaction, and 5) applications of chemical sensor.					
The category of "photonics" is devoted to the understanding of interactions between photon (light wave) and materials based on the quantum theory and also to industrial applications of photonic devices. 1) Optoelectronic devices, 2) optical processes in semiconductors and exciton, 3) nanomaterial.					
The category of "spin electronics" covers a wide area from fundamentals to applications of magnetic materials and magnetics. 1) Origin of magnetics, 2) Soft and hard magnetic materials, 3) Major applications of magnetics and magnetic materials, 4) Interaction phenomena among spins and various physical quantities, 5) Micro-magnetic devices and systems, 6) Spintronics and spin photonics					
"Physics for Electronics 1" is composed of four topics of functional materials, photonics, electroductics, and spin electronics, which will be delivered for three times for each by four professors whose expertise lie on the individual categories.					
The category of "Functional materials" is made to learn preparation, characterization and applications of functional materials for electronics and ionics based on physics and chemistry. The contents are 1) Fundamentals of amorphous and crystal, 2) Structure and property of glasses, 3) New preparation techniques of advanced materials, 4) Functional materials for ionics including Li-ion battery and fuel cell, and 5) Functional materials for optics including coatings, micro-optical components, and photonic devices.					
The category of "electroductics" is electrochemical reaction on electrode. The contents are 1) fundamentals of thermodynamics in aqueous solution, 2) fundamental of electrical double layer 3) fundamental of adsorption, 4) fundamentals of electrochemical reaction, and 5) applications of chemical sensor.					

The category of "photonics" is devoted to the understanding of interactions between photon (light wave) and materials based on the quantum theory and also to industrial applications of photonic devices.
1) Optoelectronic devices, 2) optical processes in semiconductors and exciton, 3) nanomaterial.

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

Self Preparation and Review

Students must perform their preparation and review of this subject based on the course materials with following the instruction of the teachers.

Students must perform their preparation and review of this subject based on the course materials with following the instruction of the teachers.

Related subjects

Physics for Electronics, Analysis of Inorganic Materials, Advanced Materials for Electronics, Functional Materials for Optical Applications, Analysis of Materials at Interface.

Physics for Electronics, Analysis of Inorganic Materials, Advanced Materials for Electronics, Functional Materials for Optical Applications, Analysis of Materials at Interface.

Textbook1	Book title	Physical Chemistry			ISBN	0198700725
	Author	Atkins	Publisher	Oxford University Press	Publish year	2006
Textbook2	Book title	Inorganic Chemistry			ISBN	0199264635
	Author	Shriver	Publisher	Oxford University Press	Publish year	2006

Notes for textbook

None

None

Notes for reference

Goals to be achieved

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

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

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

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

Evaluation of achievement

The final evaluation will be the sum of four categories (25%); functional materials, photonics, electroductics, spin electronics.

The final evaluation will be the sum of four categories (25%); functional materials, photonics, electroductics, spin electronics.

Examination

試験期間中には何も行わない

None during exam period

Details of examination

Taking examination and submission of report will be explained and required by the teachers during their classes.

Taking examination and submission of report will be explained and required by the teachers during their classes.

Other information

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

Electroductics; Toshiaki Hattori : thattori@ee.tut.ac.jp

Photonics; Takeshi Ishiyama: ishiyama@ee.tut.ac.jp

Spin electronics; Hiroyuki Takagi : takagi@ee.tut.ac.jp

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

Electroductics; Toshiaki Hattori : thattori@ee.tut.ac.jp

Photonics; Takeshi Ishiyama: ishiyama@ee.tut.ac.jp

Spin electronics; Hiroyuki Takagi : takagi@ee.tut.ac.jp

Reference URL

<http://www.ee.tut.ac.jp/material>

<http://www.ee.tut.ac.jp/material>

Office hours

one hour after every classes

one hour after every classes

Relations to attainment objectives of learning and education

Key words

functional materials, photonics, spin electronics, ionics, micro-optics, electrodis

functional materials, photonics, spin electronics, ionics, micro-optics, electrodis

(M42630190)Electrical Technology and Materials 2[Electrical Technology and Materials 2]

Subject name[English]	Electrical Technology and Materials 2[Electrical Technology and Materials 2]				
Schedule number	M42630190	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Wed.1~1	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	須田 善行, 稲田 亮史, 村上 義信 SUDA Yoshiyuki, INADA Ryoji, MURAKAMI Yoshinobu				
Numbering					
Objectives of class					
<p>This lecture is implemented as an introduction to electrical energy systems and intended for students and other engineering disciplines. It is being useful as reference and self-study guide for the professional dealing with this important area. There are following three sub courses to choose from.</p> <p>This lecture is implemented as an introduction to electrical energy systems and intended for students and other engineering disciplines. It is being useful as reference and self-study guide for the professional dealing with this important area. There are following three sub courses to choose from.</p>					
Contents of class					
<p>Sub Course 1(Y. suda)</p> <ol style="list-style-type: none"> 1. Fundamental concept of electrical energy engineering 2. Three-phase systems 3. Power electronics <p>Sub Course 2(R. Inada)</p> <ol style="list-style-type: none"> 1. Introduction of Electrochemical Energy Conversion Devices 2. Lithium-Ion Secondary Batteries 3. Recent Trend in Electrochemical Energy Conversion Devices <p>Sub Course 3(Yo. murakami)</p> <ol style="list-style-type: none"> 1. Introduction of Electric Energy Systems 2. High Voltage Engineering and Electrical Insulation 3. Fundamental Properties of Dielectrics and Electrical Insulating Materials. <p>Sub Course 1(Y. suda)</p> <ol style="list-style-type: none"> 1. Fundamental concept of electrical energy engineering 2. Three-phase systems 3. Power electronics <p>Sub Course 2(R. Inada)</p> <ol style="list-style-type: none"> 1. Introduction of Electrochemical Energy Conversion Devices 2. Lithium-Ion Secondary Batteries 3. Recent Trend in Electrochemical Energy Conversion Devices <p>Sub Course 3(Yo. murakami)</p> <ol style="list-style-type: none"> 1. Introduction of Electric Energy Systems 2. High Voltage Engineering and Electrical Insulation 3. Fundamental Properties of Dielectrics and Electrical Insulating Materials. 					
Self Preparation and Review					
Related subjects					
<p>Basic electrical power engineering course is prerequisite.</p> <p>Basic electrical power engineering course is prerequisite.</p>					
Notes for textbook					
<p>Materials will be prepared by the lecturer.</p> <p>Materials will be prepared by the lecturer.</p>					
Notes for reference					
Goals to be achieved					

Evaluation of achievement

Marks are based on examinations(100%).

Marks are based on examinations(100%).

Examination

定期試験を実施(対面)

Examination(Face to Face)

Details of examination**Other information****Reference URL**

(1) J. Larminie and A. Dicks: Fuel Cell Systems Explained (Wiley)

(2) M. Yoshio, R.J. Brodd and A. Kozawa: Lithium Ion Batteries: Science and Technologies (Springer-Verlag)

(3) E. Kuffel, W. Zaengel and J. Kuffel: High Voltage Engineering (Newnes)

(1) J. Larminie and A. Dicks: Fuel Cell Systems Explained (Wiley)

(2) M. Yoshio, R.J. Brodd and A. Kozawa: Lithium Ion Batteries: Science and Technologies (Springer-Verlag)

(3) E. Kuffel, W. Zaengel and J. Kuffel: High Voltage Engineering (Newnes)

Office hours**Relations to attainment objectives of learning and education****Key words**

(M42630230)LSI Process 2[LSI Process 2]

Subject name[English]	LSI Process 2[LSI Process 2]				
Schedule number	M42630230	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Tue.1~1	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	澤田 和明, 村上 裕二, 関口 寛人, 高橋 一浩 SAWADA Kazuaki, MURAKAMI Yuji, SEKIGUCHI Hiroto, TAKAHASHI Kazuhiro				
Numbering					
Objectives of class					
From the viewpoint of deep understanding of LSI processes, semiconductors devices including material desgin and an example of latest device will be lectured.					
From the viewpoint of deep understanding of LSI processes, semiconductors devices including material desgin and an example of latest device will be lectured.					
Contents of class					
Integrated circuits					
Sensor processing					
Optical devices					
MEMS/NEMS					
Latest MOS FETs					
Current topics in IC/MEMS/sensor					
Integrated circuits					
Sensor processing					
Optical devices					
MEMS/NEMS					
Latest MOS FETs					
Current topics in IC/MEMS/sensor					
Self Preparation and Review					
Related subjects					
The basic knowledge on the quantum mechanics, thermodynamics, and electronics are desirable.					
Semiconductor Physics, Master course					
The basic knowledge on the quantum mechanics, thermodynamics, and electronics are desirable.					
Semiconductor Physics, Master course					
Notes for textbook					
Physics of Semiconducotr Devices					
S.M.Sze, Willy					
Physics of Semiconducotr Devices					
S.M.Sze, Willy					
Notes for reference					
Goals to be achieved					
(1) To understand fundamental aspects on LSI process, and semiconductor devices including material design.					
(2) To get the knowledge on the latest technologies on LSI process.					
(1) To understand fundamental aspects on LSI process, and semiconductor devices including material design.					
(2) To get the knowledge on the latest technologies on LSI process.					
Evaluation of achievement					
Reports (100%)					

Reports (100%)
Examination レポートで実施 By Report
Details of examination
Other information K.Sawada (C-605) sawada@ee.tut.ac.jp Yu.Murakami (C-606) ymurakami@ee.tut.ac.jp H. Sekiguchi (C-610) sekiguchi@ee.tut.ac.jp ext. 6744 K. Takahashi (C-406) takahashi@ee.tut.ac.jp ext. 6755 K.Sawada (C-605) sawada@ee.tut.ac.jp Yu.Murakami (C-606) ymurakami@ee.tut.ac.jp H. Sekiguchi (C-610) sekiguchi@ee.tut.ac.jp ext. 6744 K. Takahashi (C-406) takahashi@ee.tut.ac.jp ext. 6755
Reference URL http://www.tut.ac.jp/english/introduction/02EE.pdf (department) http://www.int.ee.tut.ac.jp/ (devision) http://www.tut.ac.jp/english/research/research_highlights.html (research activities) http://www.tut.ac.jp/english/introduction/02EE.pdf (department) http://www.int.ee.tut.ac.jp/ (devision) http://www.tut.ac.jp/english/research/research_highlights.html (research activities)
Office hours book an appointment by e-mail, phone, etc. book an appointment by e-mail, phone, etc.
Relations to attainment objectives of learning and education
Key words

(M42630250)Information and Communication Technology 2[Information and Communication Technology 2]

Subject name[English]	Information and Communication Technology 2[Information and Communication Technology 2]				
Schedule number	M42630250	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Mon.3~3	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	大平 孝, 上原 秀幸, 竹内 啓悟 OHIRA Takashi, UEHARA Hideyuki, TAKEUCHI Keigo				
Numbering					
Objectives of class					
<p>Students select between the following two courses:</p> <p>The first course is intended for learning how to design microwave circuits needed for advanced wireless communication systems and wireless power transmission systems. The distributed constant element theory is addressed to characterize linear circuits at high frequencies. Based on this technique, students challenge synthesis of a variety of microwave signal and power processing functions.</p> <p>The second course is intended for learning mainly medium access control, multi-hop communications and other topics related to wireless networks. Students are required to give solutions of the problems which cause performance degradation.</p> <p>Students select between the following two courses:</p> <p>The first course is intended for learning how to design microwave circuits needed for advanced wireless communication systems and wireless power transmission systems. The distributed constant element theory is addressed to characterize linear circuits at high frequencies. Based on this technique, students challenge synthesis of a variety of microwave signal and power processing functions.</p> <p>The second course is intended for learning mainly medium access control, multi-hop communications and other topics related to wireless networks. Students are required to give solutions of the problems which cause performance degradation.</p>					
Contents of class					
<p>Course 1 provided by Prof. Ohira:</p> <ol style="list-style-type: none"> 1. Transmission lines 2. Scattering matrix 3. Mizuhashi Smith chart <p>Course 2 provided by Prof. Uehara:</p> <ol style="list-style-type: none"> 1. Medium access control protocols 2. Multi-hop communications 3. Ad hoc and sensor networks <p>Course 1 provided by Prof. Ohira:</p> <ol style="list-style-type: none"> 1. Transmission lines 2. Scattering matrix 3. Mizuhashi Smith chart <p>Course 2 provided by Prof. Uehara:</p> <ol style="list-style-type: none"> 1. Medium access control protocols 2. Multi-hop communications 3. Ad hoc and sensor networks 					
Self Preparation and Review					
Related subjects					
<p>Course 1:</p> <p>Deep understanding on electromagnetic field theory, linear passive and reciprocal circuit theory, and sophisticated experience on complex and matrix mathematics are prerequisite.</p> <p>Course 2:</p> <p>The students who will take this course are supposed to have sufficient knowledge about the following; wireless digital</p>					

modulation and demodulation, radio propagation characteristic, signal processing, probability, random variables and stochastic process.

Course 1:

Deep understanding on electromagnetic field theory, linear passive and reciprocal circuit theory, and sophisticated experience on complex and matrix mathematics are prerequisite.

Course 2:

The students who will take this course are supposed to have sufficient knowledge about the following; wireless digital modulation and demodulation, radio propagation characteristic, signal processing, probability, random variables and stochastic process.

Notes for textbook

Course 1: Lecture on the blackboard without resorting to textbooks.

Course 2: Instruct in 1st class.

Course 1: Lecture on the blackboard without resorting to textbooks.

Course 2: Instruct in 1st class.

Notes for reference

Goals to be achieved

Course 1:

- Understand the distributed constant elements and concept of scattering matrix.
- Derive frequency responses on linear RF circuits exploiting Mizuhashi Smith chart.
- Characterize various kinds of high frequency functional circuits and compose them based upon given specifications.

Course 2:

- Understand the mechanism of medium access control and multi-hop communications
- Understand the characteristics of ad hoc and sensor networks
- Present a solution or a new application for the above

Course 1:

- Understand the distributed constant elements and concept of scattering matrix.
- Derive frequency responses on linear RF circuits exploiting Mizuhashi Smith chart.
- Characterize various kinds of high frequency functional circuits and compose them based upon given specifications.

Course 2:

- Understand the mechanism of medium access control and multi-hop communications
- Understand the characteristics of ad hoc and sensor networks
- Present a solution or a new application for the above

Evaluation of achievement

Course 1: Marks are based on the final test.

Course 2: Marks are based on reports and presentations.

Course 1: Marks are based on the final test.

Course 2: Marks are based on reports and presentations.

Examination

定期試験を実施(対面)

Examination(Face to Face)

Details of examination

Other information

For e-mail address information, visit <http://www.comm.ee.tut.ac.jp/>

For e-mail address information, visit <http://www.comm.ee.tut.ac.jp/>

Reference URL

<http://www.comm.ee.tut.ac.jp/>

<http://www.comm.ee.tut.ac.jp/>

Office hours

Appoint a time slot via email

Appoint a time slot via email

Relations to attainment objectives of learning and education

Key words

microwave, circuit, electromagnetic field, Smith chart, scattering matrix, distributed constant element, wireless networks, medium access control, multi-hop
microwave, circuit, electromagnetic field, Smith chart, scattering matrix, distributed constant element, wireless networks, medium access control, multi-hop

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

Subject name[English]	Seminar on Computer Science and Engineering I[Seminar on Computer Science and Engineering I]				
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 Program for Master's Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, 3系各教員 3kei kyomu iin-S, 3kei kakukyouin				
Numbering					
Objectives of class					
The course is intended for students to study basic materials in depth, related to his/her research subjects in computer science and engineering. It is also aimed for students to acquire various skills, required in general research work, such as those for oral presentation, and technical discussion and writing.					
Contents of class					
While specific contents depend on the research areas students are involved in, it is usually the case for students to read relevant textbooks/research papers and report on them, as well as to present and discuss on the research work of their own.					
Self Preparation and Review					
Consult with your advisor.					
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/explanation, and clear presentation.					
Evaluation of achievement					
Will be evaluated by taking into account various factors overall, such as technical explanation, question answering, discussion involvements and so on.					
Examination					
その他 None during exam period					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					



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

Subject name[English]	Seminar on Computer Science and Engineering II[Seminar on Computer Science and Engineering II]				
Schedule number	M43610020	Subject area	Advanced Computer Science and Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Computer Science and Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, 3系各教員 3kei kyomu iin-S, 3kei kakukyouin				
Numbering					
Objectives of class	<p>The course is intended for students to study basic materials in depth, related to his/her research subjects in computer science and engineering.</p> <p>It is also aimed for students to acquire various skills, required in general research work, such as those for oral presentation, and technical discussion and writing.</p>				
Contents of class	While specific contents depend on the research areas students are involved in, it is usually the case for students to read relevant textbooks/research papers and report on them, as well as to present and discuss on the research work of their own.				
Self Preparation and Review	Consult with your advisor.				
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/explanation, and clear presentation.				
Evaluation of achievement	Will be evaluated by taking into account various factors overall, such as technical explanation, question answering, discussion involvements and so on.				
Examination	その他 None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					



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

Subject name[English]	Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering]				
Schedule number	M43610030	Subject area	Advanced Computer Science and Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~2
Department Offered	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, 3系各教員 3kei kyomu iin-S, 3kei kakukyoin				
Numbering					
Objectives of class	<p>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.</p> <p>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.</p>				
Contents of class	<p>It is usually the case that thesis research is carried out on individual bases with specific contents differing from one student to another.</p> <p>Consult with your advisor for any further details.</p>				
Self Preparation and Review					
Related subjects	<p>Consult with your advisor for them.</p>				
Notes for textbook	<p>Consult with your advisor for them.</p>				
Notes for reference					
Goals to be achieved	<p>To acquire abilities for doing research and development at technically high level, sophisticated decision making, and leading large scale research projects.</p>				
Evaluation of achievement	<p>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.</p>				
Examination	<p>その他 None during exam period</p>				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					

Key words

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

Subject name[English]	Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering]				
Schedule number	M43610030	Subject area	Advanced Computer Science and Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, 3系各教員 3kei kyomu iin-S, 3kei kakukyoin				
Numbering					
Objectives of class					
<p>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.</p> <p>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.</p>					
Contents of class					
<p>It is usually the case that thesis research is carried out on individual bases with specific contents differing from one student to another.</p> <p>Consult with your advisor for any further details.</p>					
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.					
Examination					
その他 None during exam period					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					

Key words

(M4361003T)Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering]

Subject name[English]	Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering]				
Schedule number	M4361003T	Subject area	Advanced Computer Science and Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Computer Science and Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, 3系各教員 3kei kyomu iin-S, 3kei kakukyoin				
Numbering					
Objectives of class	<p>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.</p> <p>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.</p>				
Contents of class	<p>It is usually the case that thesis research is carried out on individual bases with specific contents differing from one student to another.</p> <p>Consult with your advisor for any further details.</p>				
Self Preparation and Review	<p>Consult with your advisor for them.</p>				
Related subjects	<p>Consult with your advisor for them.</p>				
Notes for textbook	<p>Consult with your advisor for them.</p>				
Notes for reference					
Goals to be achieved	<p>To acquire abilities for doing research and development at technically high level, sophisticated decision making, and leading large scale research projects.</p>				
Evaluation of achievement	<p>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.</p>				
Examination	<p>その他 None during exam period</p>				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					

Key words

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

Subject name[English]	Seminar on Computer Science and Engineering[Seminar on Computer Science and Engineering]				
Schedule number	M43610040	Subject area	Advanced Computer Science and Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Computer Science and Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, 3系各教員 3kei kyomu iin-S, 3kei kakukyoin				
Numbering					
Objectives of class	<p>The course is intended for students to study basic materials in depth, related to his/her research subjects in computer science and engineering.</p> <p>It is also aimed for students to acquire various skills, required in general research work, such as those for oral presentation, and technical discussion and writing.</p>				
Contents of class	While specific contents depend on the research areas students are involved in, it is usually the case for students to read relevant textbooks/research papers and report on them, as well as to present and discuss on the research work of their own.				
Self Preparation and Review	Consult with your advisor.				
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/explanation, and clear presentation.				
Evaluation of achievement	Will be evaluated by taking into account various factors overall, such as technical explanation, question answering, discussion involvements and so on.				
Examination	その他 None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					

Key words

(M43630020)System Design Project[System Design Project]

Subject name[English]	System Design Project[System Design Project]				
Schedule number	M43630020	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Tue.4 ~ 4,Fri.4 ~5	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S3系教務委員 3kei kyomu Iin-S				
Numbering					
Objectives of class	<p>The project is intended for students to foster their interests in research problems on computer science and engineering and to acquire ability for independent studies.</p> <p>It is also aimed for students to acquire design ability for their thesis research such as the purpose, the background knowledge, the research topic, the plan/schedule and to present the progress.</p>				
Contents of class	<p>It is usually the case that the project is carried out on individual bases with specific contents differing from on student to another.</p> <p>Consult with your advisor for any further details.</p>				
Self Preparation and Review	Consult with your advisor.				
Related subjects	Consult with your advisor for them.				
Notes for textbook	Consult with your advisor.				
Notes for reference					
Goals to be achieved	To acquire design abilities for doing research and development at technically high level and leading large scale research projects				
Evaluation of achievement	Will be evaluated by the poster presentation and report including the research purpose, background knowledge,research topic,plan/scheduling and progress.				
Examination	その他 None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					

Key words

(M43630080)Computers and Education[Computers and Education]

Subject name[English]	Computers and Education[Computers and Education]				
Schedule number	M43630080	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Mon.5~5	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	河合 和久 KAWAI Kazuhisa				
Numbering					

Objectives of class

The purpose of the class is to deepen and broaden students' knowledge of their own expertise in relation to the society in learning about computers and technology in education.

The purpose of the class is to deepen and broaden students' knowledge of their own expertise in relation to the society in learning about computers and technology in education.

Contents of class

Students will be offered some overviews of computers and education. Students will give some presentations on the following problems: (1) to make the teaching plan of their own research subjects for pupils or junior high school students, (2) to make a simulated class based on the plan, (3) to discuss the simulated class. At the end of term, students are required to submit an essay on computers and education.

- 1.Guidance, Lecture#1(Introduction to subject "Information".)
- 2.Lecture#2(Computer system for education. and Software as course material.)
- 3.Lecture#3(Cooperation with the period of integrated study.)
- 4.Lecture#4(Simulated class: plan and evaluation.)
- 5.Lecture#5(Keep an "Information" teacher. and Teaching plan.)
- 6.Lecture#6(Information sending and presentation.)
- 7.Lecture#7(Group work by collaboration and presentation.)
- 8.Lecture#8(Media literacy., Information ethics education. and Network.)
- 9.Presentations of Teaching Plans #1
- 10.Presentations of Teaching Plans #2
- 11.Lecture#9(Expression of information and multimedia. and Topics in information society.)
- 12.Lecture#10(Algorithm and programming. and Information retrieval and database.)
- 13.Simulated Classes #1
- 14.Simulated Classes #2
- 15.Simulated Classes #3
- 16.Presentations of Final Reports

Students will be offered some overviews of computers and education. Students will give some presentations on the following problems: (1) to make the teaching plan of their own research subjects for pupils or junior high school students, (2) to make a simulated class based on the plan, (3) to discuss the simulated class. At the end of term, students are required to submit an essay on computers and education.

- 1.Guidance, Lecture#1(Introduction to subject "Information".)
- 2.Lecture#2(Computer system for education. and Software as course material.)
- 3.Lecture#3(Cooperation with the period of integrated study.)
- 4.Lecture#4(Simulated class: plan and evaluation.)
- 5.Lecture#5(Keep an "Information" teacher. and Teaching plan.)
- 6.Lecture#6(Information sending and presentation.)
- 7.Lecture#7(Group work by collaboration and presentation.)
- 8.Lecture#8(Media literacy., Information ethics education. and Network.)

- 9. Presentations of Teaching Plans #1
- 10. Presentations of Teaching Plans #2
- 11. Lecture#9(Expression of information and multimedia. and Topics in information society.)
- 12. Lecture#10(Algorithm and programming. and Information retrieval and database.)
- 13. Simulated Classes #1
- 14. Simulated Classes #2
- 15. Simulated Classes #3
- 16. Presentations of Final Reports

Self Preparation and Review

Students are required to solve the problems mentioned above.

Students are required to solve the problems mentioned above.

Related subjects

Notes for textbook

Students will be offered some overviews of "JOUHOUKA KYOUIKUHOU" (the following reference) using WWW.
 Students will be offered some overviews of "JOUHOUKA KYOUIKUHOU" (the following reference) using WWW.

Reference1	Book title	JOUHOUKA KYOUIKUHOU (KAITEI NI-HAN) *** in JAPANESE ***		ISBN	978-4-274-20664-1
	Author	Yasushi Kuno, et al.	Publisher	OHM-SHA	Publish year

Notes for reference

Goals to be achieved

At the end of the course, students will be able to deepen and broaden students' knowledge of their own expertise in relation to the society, and to represent them using computers and technology in education.

At the end of the course, students will be able to deepen and broaden students' knowledge of their own expertise in relation to the society, and to represent them using computers and technology in education.

Evaluation of achievement

Written reports 50%, In class work 50%.
 Written reports 50%, In class work 50%.

Examination

授業を実施
 Regular Class

Details of examination

Other information

Reference URL

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

Office hours

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

Relations to attainment objectives of learning and education

Key words

Informatics, Computer Literacy, Scientific Communication.
Informatics, Computer Literacy, Scientific Communication.

(M43630160)Quantum Biology and Materials Science[Quantum Biology and Materials Science]

Subject name[English]	Quantum Biology and Materials Science[Quantum Biology and Materials Science]				
Schedule number	M43630160	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Tue.5~5	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	栗田 典之, 後藤 仁志 KURITA Noriyuki, GOTO Hitoshi				
Numbering					
Objectives of class					
<p>The objective of this class is to understand basis biophysical phenomena in the organisms based on the concept of quantum chemistry, that is, molecular orbital (MO) theory.</p> <p>In achieving this objective, students will be required to attempt to acquire the elementary concepts in MO theory, and they will learn about the electronic properties of biological molecules such as proteins, RNA and DNA.</p> <p>The objective of this class is to understand basis biophysical phenomena in the organisms based on the concept of quantum chemistry, that is, molecular orbital (MO) theory.</p> <p>In achieving this objective, students will be required to attempt to acquire the elementary concepts in MO theory, and learn about the electronic properties of biological molecules such as proteins, RNA and DNA.</p>					
Contents of class					
<p>Considering the preliminary knowledge of the participates in this class, some topics from the following things will be chosen to be learned.</p> <p>(1) Basis and elementary concepts for molecular orbital (MO) theory (1 and 2 weeks)</p> <p>(2) Applications of MO method to small molecules (3 and 4 weeks)</p> <p>(3) MO calculations for amino acids and their peptides (5 and 6 weeks)</p> <p>(4) MO calculations for DNA, RNA bases and base pairs (7, 8 and 9 weeks)</p> <p>(5) MO calculations for complexes with proteins and ligand molecules (10, 11 and 12 weeks)</p> <p>(6) MO calculations for DNA, RNA and their complexes with proteins (13, 14 and 15 weeks)</p> <p>Considering the preliminary knowledge of the participates in this class, some topics from the following things will be chosen to be learned.</p> <p>(1) Basis and elementary concepts for molecular orbital(MO) theory (1st and 2nd weeks)</p> <p>(2) Applications of MO method to small molecules (3rd and 4th weeks)</p> <p>(3) MO calculations for amino acids and their peptides (5th and 6th weeks)</p> <p>(4) MO calculations for DNA, RNA bases and base pairs (7th, 8th and 9h weeks)</p> <p>(5) MO calculations for complexes with proteins and ligand (10th, 11th and 12th weeks)</p> <p>(6) MO calculations for DNA, RNA and their complexes with proteins (13th, 14th and 15th weeks)</p>					
Self Preparation and Review					
Elementary concepts in MO theory as well as biomolecules such as proteins, RNA and DNA are required.					
Related subjects					
Basis knowledge about quantum chemistry and biomolecules such as proteins, RNA and DNA is required.					
Notes for textbook					
<p>教科書: 資料配付</p> <p>参考書:</p> <p>"Molecular orbital calculations for amino acids and peptides", by Anne-Marie Sapse</p> <p>Reference book</p> <p>"Molecular orbital calculations for amino acids and peptides", by Anne-Marie Sapse</p>					
Notes for reference					

Goals to be achieved

The objective of this class is to understand basis biophysical phenomena in the organisms based on the concept of quantum chemistry.

The objective of this class is to understand basis biophysical phenomena in the organisms based on the concept of quantum chemistry.

Evaluation of achievement

授業で与えられた課題に対するレポート内容及びその発表内容(70%)、テスト(30%)の割合で、総合的に評価する。

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

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

B: Achieved 80% of goals and obtained total points of exam and reports, 65 or higher (out of 100 points).

C: Achieved 60% of goals and obtained total points of exam and reports, 55 or higher (out of 100 points).

Examination

レポートで実施

By Report

Details of examination**Other information**

連絡先

教員の居室:F棟 306号室

電話番号:0532-44-6875

E-mail: kurita@cs.tut.ac.jp

Reference URL**Office hours**

上記の E-mail による連絡により、適宜対応する。

Please check the schedule by E-mail in advance.

Relations to attainment objectives of learning and education**Key words**

DNA, RNA, Protein, molecular orbital calculation

DNA, Protein, molecular orbital calculation

(M43630220)Speech and Language Processing, Advanced[Speech and Language Processing, Advanced]

Subject name[English]	Speech and Language Processing, Advanced[Speech and Language Processing, Advanced]				
Schedule number	M43630220	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Wed.2~2	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	秋葉 友良, 山本 一公 AKIBA Tomoyoshi, YAMAMOTO Kazumasa				
Numbering					
Objectives of class					
Important topics on spoken / natural language processing will be discussed. Important topics on spoken / natural language processing will be discussed.					
Contents of class					
(Yamamoto) Basic of spoken language processing / Basic of speech recognition / Algorithm for continuous speech recognition / Hidden Markov Model / Language model, parsing and decoder/ Spoken dialog systems/					
(Akiba) Basic of information retrieval / Basic of natural language processing / Algorithms for string matching and text indexing / Modeling methods for sentences and documents / Automatic machine translation					
(Yamamoto) Basic of spoken language processing / Basic of speech recognition / Algorithm for continuous speech recognition / Hidden Markov Model / Language model, parsing and decoder/ Spoken dialog systems/					
(Akiba) Basic of information retrieval / Basic of natural language processing / Algorithms for string matching and text indexing / Modeling methods for sentences and documents / Automatic machine translation					
Self Preparation and Review					
Related subjects					
Information theory, Formal language theory Information theory, Formal language theory					
Notes for textbook					
Resumes will be provided, which are based on:					
<ul style="list-style-type: none"> •M.Gales & S.Young The application of hidden Markov models in speech recognition, World Scientific •L.R. Rabiner, R.W. Schafer Introduction to Digital Speech Processing World Scientific •Richado Baeza-Yates, Berthier Bibeiro-Neto Modern Information Retrieval Addison Wesley •Kevin Knight A Statistical MT Tutorial Workbook 					

Resumes will be provided, which are based on:

• M.Gales & S.Young

The application of hidden Markov models in speech recognition,
World Scientific

• L.R. Rabiner, R.W. Schafer

Introduction to Digital Speech Processing
World Scientific

• Richado Baeza-Yates, Berthier Bibeiro-Neto

Modern Information Retrieval
Addison Wesley

• Kevin Knight

A Statistical MT Tutorial Workbook

Reference1	Book title	The application of hidden Markov models in speech recognition			ISBN	
	Author	M.Gales & S.Young	Publisher	World Scientific	Publish year	
Reference2	Book title	Introduction to Digital Speech Processing			ISBN	
	Author	L.R. Rabiner, R.W. Schafer	Publisher	World Scientific	Publish year	
Reference3	Book title	Modern Information Retrieval			ISBN	
	Author	Richado Baeza-Yates, Berthier Bibeiro-Neto	Publisher	Addison Wesley	Publish year	
Reference4	Book title	A Statistical MT Tutorial Workbook			ISBN	
	Author	Kevin Knight	Publisher		Publish year	

Notes for reference

Goals to be achieved

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

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

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

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

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

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

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

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

Evaluation of achievement

Marks are based on reports (100%).

Marks are based on reports (100%).

Examination

レポートで実施

By Report

Details of examination

Other information

Tomoyosi Akiba: C-505, 44-6758, akiba@cs.tut.ac.jp

Kazumasa Yamamoto: C-506, 44-6767, yamamoto@cs.tut.ac.jp

Tomoyosi Akiba: C-505, 44-6758, akiba@cs.tut.ac.jp

Kazumasa Yamamoto: C-506, 44-6767, yamamoto@cs.tut.ac.jp

Reference URL

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

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

Office hours

16:25-17:40, Tuesday and Wednesday

16:25-17:40, Tuesday and Wednesday

Relations to attainment objectives of learning and education

Key words

spoken language processing, natural language processing, human language technology

spoken language processing, natural language processing, human language technology

(M43630280)Web Data Engineering 1[Web Data Engineering 1]

Subject name[English]	Web Data Engineering 1[Web Data Engineering 1]				
Schedule number	M43630280	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Thu.2~2	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	青野 雅樹 AONO Masaki				
Numbering					
Objectives of class					
<p>Data engineering technologies for aggregated data (including Web data) will be discussed. Main emphasis is on the information retrieval and data mining technologies. Data Mining technologies include principal component analysis, supervised learning such as classification, unsupervised learning such as clustering, and Web mining technologies. Multimedia data processing will also be discussed. The objectives of this class is to let students know the state-of-the art technologies in data mining and information retrieval.</p>					
Contents of class					
<p>Classes will be held (theoretically) 7.5 times. The last time will be kept for the exam.</p> <p>1. Information Retrieval Fundamental techniques to construct a search system, including how to build indices, how to tokenize texts, and how to extract features from texts and images, will be considered.</p> <p>2. Data and Web Mining Fundamental methods for data mining as well as Web mining are discussed.</p> <p>We plan to do one or two assignments for data mining techniques inside.</p> <p>Please note that if this lecture is held at the same time with Japanese course, the lecture might be in Japanese. The intelligent data engineering technologies for aggregated data will be focused, where the data include both semi-structured data, such as XML and JSON, and unstructured data (e.g. time series data and the Web) are included, but structured data (such as SQL) are excluded.</p> <p>Main emphasis is on the state-of-the-art technologies on data mining and information retrieval.</p> <p>For data mining technologies, both unsupervised and supervised learning methods will be discussed. The former includes principal component analysis, clustering, Web graph mining, and information filtering, while the latter includes classification and regression.</p> <p>For information retrieval technologies, we start with traditional vector space (Bag-of-Words) models, ending with deep learning based models such as skip-gram (e.g. word2vec). Both linear and non-linear dimensional reduction techniques will be covered. In addition, multimedia retrieval (3D shapes, images, and videos) will be referred.</p>					
Self Preparation and Review					
<p>It is desirable to self-study as well as review fundamental data mining techniques such as clustering, classification, principal component analysis, and regression. It is recommended installing R/Python (also sometimes Java/C++) language into your computer, because some of the lecture materials are written in R/Python language. (R is favorable for simple visualization.)</p> <p>It is desirable to self-study as well as review fundamental data mining techniques such as clustering, classification, and regression. It should be noted that the knowledge on multivariate analysis techniques such as principal component analysis is a prerequisite to this class. It is recommended installing R/Python (also sometimes Java/C++) language into your computer, because some of the lecture materials are written in R/Python language.</p>					
Related subjects					

Notes for textbook

Materials will be prepared by lecturers

References:

- (1) C. D. Manning et al, Introduction to Information Retrieval, Cambridge Univ. Press
- (2) J. Han and M. Kamber, Data Mining: Concepts and Techniques, 2nd ed, Morgan Kaufmann

Materials will be prepared by lecturers

References:

- (1) C. D. Manning et al, Introduction to Information Retrieval, Cambridge Univ. Press
- (2) J. Han and M. Kamber, Data Mining: Concepts and Techniques, 2nd ed, Morgan Kaufmann

Reference1	Book title	Information Retrieval, Implementing and Evaluating Search Engines			ISBN	978-0-262-02651-2
	Author	Stefan Butcher, Charles L.A. Clarke, Gordon V. Cormack	Publisher	MIT Press	Publish year	2010
Reference2	Book title	Data Mining: Concepts and Techniques, Third Edition			ISBN	978-0-123-81479-1
	Author	Jiawei Han, Micheline Kamber, and Jian Pei	Publisher	Morgan Kaufmann	Publish year	2011
Reference3	Book title	Data Mining Practical Machine Learning Tools and Techniques, Third Edition			ISBN	978-0-12-374856-0
	Author	Ian H. Witten, Eibe Frank, and Mark A. Hall	Publisher	Morgan Kaufmann	Publish year	2011

Notes for reference

Reference #4

Title:「Modern Information Retrieval, the concepts and technology behind search, Second Edition」

Authors:Ricardo Baeza-Yates, Bertier Ribeiro-Neto

Publisher: Addison Wesley

ISBN: 978-0-321-41691-9

Year: 2011

Reference #5

Title:「Google's PageRank and Beyond」

Authors: Amy N. Langville, Carl D. Meyer

Publisher: Princeton University Press

ISBN: 978-0-691-12202-1

Year: 2006

Reference #4

Title:「Modern Information Retrieval, the concepts and technology behind search, Second Edition」

Authors:Ricardo Baeza-Yates, Bertier Ribeiro-Neto

Publisher: Addison Wesley

ISBN: 978-0-321-41691-9

Year: 2011

Reference #5

Title:「Google's PageRank and Beyond」

Authors: Amy N. Langville, Carl D. Meyer

Publisher: Princeton University Press

ISBN: 978-0-691-12202-1

Year: 2006

Goals to be achieved

To acquire the following knowledge that can make you

1. Implement fundamental data mining technologies.
2. Understand advanced technologies for information retrieval, including dimensional reduction.
3. Design, analyze, and evaluate the information retrieval and data mining technologies.

The following items have to be achieved:

1. Able to implement and apply fundamental data mining technologies.
2. Understand fundamental technologies for information retrieval, making full use of good indexing (such as dimensional reduction) after properly representing data objects to be retrieved.
3. Able to design, analyze, and evaluate both data mining and information retrieval technologies.

Evaluation of achievement

Exercise (20%) and Final exam (80%)

A: (≥ 80), B: (≥ 65), C: (≥ 55)

Exercise (20%) and Final exam (80%)

A: (≥ 80), B: (≥ 65), C: (≥ 55)

Examination

定期試験を実施(対面)

Examination(Face to Face)

Details of examination**Other information**

Masaki Aono (C-511) aono@tut.jp

Masaki Aono (C-511) aono@tut.jp

Reference URL

<http://www.kde.cs.tut.ac.jp/~aono/myLecture.html>

<http://www.kde.cs.tut.ac.jp/~aono/myLecture.html>

Office hours

Anytime, but a priori email appointment is definitely preferable.

Anytime, but a priori email appointment is definitely preferable.

Relations to attainment objectives of learning and education

Programming skills with Java, C++, R, and Python might be preferable.

Programming skills with Java, C++, R, and Python might be preferable.

Key words

(M43630320)Bio-physical Information Systems 1[Bio-physical Information Systems 1]

Subject name[English]	Bio-physical Information Systems 1[Bio-physical Information Systems 1]				
Schedule number	M43630320	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Mon.4~4	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	福村 直博 FUKUMURA Naohiro				
Numbering					
Objectives of class					
This course lectures on advanced studies on information processing in the nervous systems and computational models for motor controls of the human movements.					
This course lectures on advanced studies on information processing in the nervous systems and computational models for motor controls of the human movements.					
Contents of class					
1. Introduction to the computational neuroscience in the motor control system					
2. Information processing in the motor system of the brain					
3-4. Motor control models of the human arm movements					
5-6. Models for motor planning in the human arm movements					
7. Models for motor planning in the human hand movements					
8. Examination					
1. Introduction to the computational neuroscience in the motor control system					
2. Information processing in the motor system of the brain					
3-4. Motor control models of the human arm movements					
5-6. Models for motor planning in the human arm movements					
7. Models for motor planning in the human hand movements					
8. Examination					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Reference1	Book title	Human Motor Control		ISBN	
	Author	David A. Rosenbaum	Publisher	Academic Press	Publish year 2010
Notes for reference					
Goals to be achieved					
1. Understand the computational processing in the motor control					
2. Understand the motor control models of the human voluntary movements					
3. Understand the models for motor planning of the human voluntary movements					
1. Understand the computational processing in the motor control					
2. Understand the motor control models of the human voluntary movements					
3. Understand the models for motor planning of the human voluntary movements					
Evaluation of achievement					
Final examination (100%), A: 100-80, B: 79-65, C: 64-55, D (fail): 54-0					
Final examination (100%), A: 100-80, B: 79-65, C: 64-55, D (fail): 54-0					

Examination

試験期間中には何も行わない

None during exam period

Details of examination**Other information**

N. Fukumura (C611, Tel: 0532-44-6772, fukumura@cs.tut.ac.jp)

N. Fukumura (C611, Tel: 0532-44-6772, fukumura@cs.tut.ac.jp)

Reference URL

<http://www.bmcs.cs.tut.ac.jp>

<http://www.bmcs.cs.tut.ac.jp>

Office hours

Monday 16:20-17:50

Monday 16:20-17:50

Relations to attainment objectives of learning and education

D1

D1

Key words

(M43630330)Bio-physical Information Systems 2[Bio-physical Information Systems 2]

Subject name[English]	Bio-physical Information Systems 2[Bio-physical Information Systems 2]				
Schedule number	M43630330	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Spring2 term	Day of the week,period	Mon.4~4	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Begging grade	M1, M2
Charge teacher name[Roman alphabet mark]	堀川 順生 HORIKAWA Junsei				
Numbering					
Objectives of class					
<p>In this course, we study information processing in the nervous system of animals and humans. The course consists of structures of the nervous system, mechanisms of action potentials and synaptic transmission, and mechanisms of sensory information processing in the peripheral and central nervous system.</p> <p>In this course, we study information processing in the nervous system of animals and humans. The course consists of structures of the nervous system, mechanisms of action potentials and synaptic transmission, and mechanisms of sensory information processing in the peripheral and central nervous system.</p>					
Contents of class					
<ol style="list-style-type: none"> 1. Introduction to the information processing in the nervous system 2. Structures of the nervous system and action potentials and synaptic transmission 3. Information processing in the visual system 1 4. Information processing in the visual system 2 5. Information processing in the auditory system 6. Information processing in the somatosensory system 7.5. Information processing in the olfactory and gustatory systems 8. Final examination 					
<ol style="list-style-type: none"> 1. Introduction to the information processing in the nervous system 2. Structures of the nervous system and action potentials and synaptic transmission 3. Information processing in the visual system 1 4. Information processing in the visual system 2 5. Information processing in the auditory system 6. Information processing in the somatosensory system 7.5. Information processing in the olfactory and gustatory systems 8. Final examination 					
Self Preparation and Review					
Related subjects					
Bio-physical Information Systems 1					
Bio-physical Information Systems 1					
Notes for textbook					
Handouts referring the reference books are used.					
Handouts referring reference books are used.					
Reference1	Book title	Neuroscience – Exploring the brain		ISBN	
	Author	Bear, Connors, Paradiso	Publisher	Lippincott Williams & Wilkins	Publish year 2007
Reference2	Book title	Cognitive Neuroscience – The biology of the brain		ISBN	
	Author	Gazzaniga, Ivry,	Publisher	WW Norton &	Publish year 2008

		Mangun		Co Incm		
Reference3	Book title	Neuroscience – The biology of the brain			ISBN	
	Author	Gazzaniga, Ivry, Mangun	Publisher	WW Norton & Co Incm	Publish year	2008
Notes for reference						
Goals to be achieved						
1. Understand the structures of neurons and the peripheral and central nervous systems 2. Understand neural and synaptic mechanisms for information processing and Hodgekin–Huxley equation 3. Understand the neural information processing in the visual, auditory, somatosensory, olfactory and gustatory systems 1. Understand the structures of neurons and the peripheral and central nervous systems 2. Understand neural and synaptic mechanisms for information processing and Hodgekin–Huxley equation 3. Understand the neural information processing in the visual, auditory, somatosensory, olfactory and gustatory systems						
Evaluation of achievement						
[Evaluation basis] Students who attend all classes will be evaluated as follows: A: Achieved all goals and obtained total points of exam, 80 or higher (out of 100 points). B: Achieved 70 % of goals and obtained total points of exam, 65 or higher (out of 100 points). C: Achieved 60 % of goals and obtained total points of exam, 55 or higher (out of 100 points). [Evaluation basis] Students who attend all classes will be evaluated as follows: A: Achieved all goals and obtained total points of exam, 80 or higher (out of 100 points). B: Achieved 70 % of goals and obtained total points of exam, 65 or higher (out of 100 points). C: Achieved 60 % of goals and obtained total points of exam, 55 or higher (out of 100 points).						
Examination						
定期試験を実施(対面) Examination(Face to Face)						
Details of examination						
Other information						
Junsei Horikawa (F407, Tel: 0532-44-6891, horikawa@cs.tut.ac.jp) Junsei Horikawa (F407, Tel: 0532-44-6891, horikawa@cs.tut.ac.jp)						
Reference URL						
Office hours						
Monday 16:20–17:50 Monday 16:20–17:50						
Relations to attainment objectives of learning and education						
Key words						

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

Subject name[English]	Seminar on Environmental and Life Science I[Seminar on Environmental and Life Science I]				
Schedule number	M44610010	Subject area	Advanced Environmental and Life Sciences	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	3
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu Iin-S, 4kei kakukyouin				
Numbering					
Objectives of class					
This course will provide the students with opportunities to study on his/her research subjects on environmental and life sciences by reading textbooks and scientific papers under the guidance of his/her supervisor. The aim of the lesson for the students is to learn knowledge and presentation skills required for his/her research in the seminar as well as to deepen his/her understanding of environmental and life sciences.					
Contents of class					
The students will be required to read textbooks and papers written by other language than Japanese, especially English, which are suggested by his/her supervisor, and to report and discuss deeply on his/her research subject in the seminar.					
Self Preparation and Review					
Related subjects					
Seminar on Environmental and Life Science II Thesis Research on Environmental and Life Science All other relevant subjects in Advanced Environmental and Life Sciences					
Notes for textbook					
Supervisor will recommend textbooks, papers, and research materials to students.					
Notes for reference					
Goals to be achieved					
To acquire basic knowledge on environmental and life sciences To understand the contents of scientific papers in a given field of environmental and life sciences To be able to make oral and poster presentations relevant to papers he/she has read.					
Evaluation of achievement					
The evaluation is based on the scores of reading textbooks and scientific papers, discussions, reports and presentations of his/her research in the seminar. His/her supervisor evaluates the scores.					
Examination					
その他 None during exam period					
Details of examination					
Other information					
Supervisor(s)					
Reference URL					
http://ens.tut.ac.jp/en/					
Office hours					
Students are encouraged visiting by appointment.					
Relations to attainment objectives of learning and education					
Key words					
Environmental science and technology, life science, materials science and engineering, applied chemistry					

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

Subject name[English]	Seminar on Environmental and Life Science II[Seminar on Environmental and Life Science II]				
Schedule number	M44610020	Subject area	Advanced Environmental and Life Sciences	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	3
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Environmental and Life Sciences			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu Iin-S, 4kei kakukyouin				
Numbering					
Objectives of class					
Based on the Seminar on Environmental and Life Science I, this course will further provide the students with the opportunity to study on his/her research subject in environmental and life sciences by reading textbooks and papers under the guidance of his/her supervisor. The students will learn the knowledge and the presentation skills required for his/her research in the seminar.					
Contents of class					
The students will be required to read textbooks and papers written by other language than Japanese, especially English, which are suggested by his/her supervisor, and to report and discuss deeply on his/her research subject in the seminar.					
Self Preparation and Review					
Related subjects					
Seminar on Environmental and Life Science I Thesis Research on Environmental and Life Science All other relevant subjects in Advanced Environmental and Life Sciences					
Notes for textbook					
Supervisor will recommend textbooks, papers, and research materials to students.					
Notes for reference					
Goals to be achieved					
To acquire basic knowledge on environmental and life sciences To understand the contents of scientific papers in a given field of environmental and life sciences To be able to make oral and poster presentations relevant to papers he/she has read.					
Evaluation of achievement					
The evaluation is based on the scores of reading textbooks and scientific papers, discussions, reports and presentations of his/her research in the seminar. His/her supervisor evaluates the scores.					
Examination					
その他 None during exam period					
Details of examination					
Other information					
Supervisor(s)					
Reference URL					
http://ens.tut.ac.jp/en/					
Office hours					
Students are encouraged visiting by appointment.					
Relations to attainment objectives of learning and education					
Key words					
Environmental science and technology, life science, materials science and engineering, applied chemistry					

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

Subject name[English]	Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]				
Schedule number	M44610030	Subject area	Advanced Environmental and Life Sciences	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~2
Department Offered	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu iin-S, 4kei kakuyouin				
Numbering					
Objectives of class	In the course, the students will perform advanced researches on the environmental and life science under the direction of his/her supervisor in the laboratory. The aims of this lesson are to acquire the knowledge and experimental and analytical skills required for his/her research subject, to learn the scientific and social importance of his/her subject by researching for related studies by others, and to write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.				
Contents of class	The students are required to have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be described as a Master's Thesis. The students must also present the results from his/her research, discuss, and answer the questions with the reviewers in the final master's dissertation defense.				
Self Preparation and Review					
Related subjects	Seminar on Environmental and Life Science I Seminar on Environmental and Life Science II				
Notes for textbook	Supervisor will recommend textbooks, papers, and research materials to students.				
Notes for reference					
Goals to be achieved	To acquire basic knowledge on environmental and life sciences To master experimental techniques and analytical skills required for research on a given field of environmental and life sciences To be able to present and discuss on the results of his/her research To be able to make safety control in experimental work				
Evaluation of achievement	The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).				
Examination	その他 None during exam period				
Details of examination					
Other information	Supervisor				
Reference URL	http://ens.tut.ac.jp/en/				
Office hours	Students are encouraged visiting by appointment.				
Relations to attainment objectives of learning and education					

Key words

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

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

Subject name[English]	Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]				
Schedule number	M44610030	Subject area	Advanced Environmental and Life Sciences	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu iin-S, 4kei kakuyouin				
Numbering					
Objectives of class					
In the course, the students will perform advanced researches on the environmental and life science under the direction of his/her supervisor in the laboratory. The aims of this lesson are to acquire the knowledge and experimental and analytical skills required for his/her research subject, to learn the scientific and social importance of his/her subject by researching for related studies by others, and to write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.					
Contents of class					
The students are required to have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be described as a Master's Thesis. The students must also present the results from his/her research, discuss, and answer the questions with the reviewers in the final master's dissertation defense.					
Self Preparation and Review					
Related subjects					
Seminar on Environmental and Life Science I Seminar on Environmental and Life Science II					
Notes for textbook					
Supervisor will recommend textbooks, papers, and research materials to students.					
Notes for reference					
Goals to be achieved					
To acquire basic knowledge on environmental and life sciences To master experimental techniques and analytical skills required for research on a given field of environmental and life sciences To be able to present and discuss on the results of his/her research To be able to make safety control in experimental work					
Evaluation of achievement					
The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).					
Examination					
その他 None during exam period					
Details of examination					
Other information					
Supervisor					
Reference URL					
http://ens.tut.ac.jp/en/					
Office hours					
Students are encouraged visiting by appointment.					
Relations to attainment objectives of learning and education					

Key words

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

(M44610033)Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]

Subject name[English]	Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]				
Schedule number	M44610033	Subject area	Advanced Environmental and Life Sciences	Required or elective	Required
Time of starting a course	1.5Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~2
Department Offered	Environmental and Life Sciences			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu Iin-S, 4kei kakukyoin				
Numbering					
Objectives of class	☆保証科目のためシラバス入力不要				
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
Examination	その他				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]				
Schedule number	M4461003T	Subject area	Advanced Environmental and Life Sciences	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Environmental and Life Sciences			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu iin-S, 4kei kakuyouin				
Numbering					
Objectives of class	In the course, the students will perform advanced researches on the environmental and life science under the direction of his/her supervisor in the laboratory. The aims of this lesson are to acquire the knowledge and experimental and analytical skills required for his/her research subject, to learn the scientific and social importance of his/her subject by researching for related studies by others, and to write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.				
Contents of class	The students are required to have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be described as a Master's Thesis. The students must also present the results from his/her research, discuss, and answer the questions with the reviewers in the final master's dissertation defense.				
Self Preparation and Review					
Related subjects	Seminar on Environmental and Life Science I Seminar on Environmental and Life Science II				
Notes for textbook	Supervisor will recommend textbooks, papers, and research materials to students.				
Notes for reference					
Goals to be achieved	To acquire basic knowledge on environmental and life sciences To master experimental techniques and analytical skills required for research on a given field of environmental and life sciences To be able to present and discuss on the results of his/her research To be able to make safety control in experimental work				
Evaluation of achievement	The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).				
Examination	その他 None during exam period				
Details of examination					
Other information	Supervisor(s)				
Reference URL	http://ens.tut.ac.jp/en/				
Office hours	Students are encouraged visiting by appointment.				
Relations to attainment objectives of learning and education					

Key words

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

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

Subject name[English]	Seminar on Environmental and Life Science[Seminar on Environmental and Life Science]				
Schedule number	M44610040	Subject area	Advanced Environmental and Life Sciences	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Environmental and Life Sciences			Begging grade	M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu Iin-S, 4kei kakukyoin				
Numbering					
Objectives of class					
This course will provide the students with the opportunity to study on his/her research subject in environmental and life sciences by reading textbooks and papers under the guidance of his/her supervisor. The students will learn the knowledge and the presentation skills required for his/her research in the seminar.					
Contents of class					
The students will be expected to read textbooks and papers written by foreign language that are indicated by his/her supervisor, and report and discuss deeply on his/her research subject in the seminar.					
Self Preparation and Review					
Related subjects					
Thesis Research on Environmental and Life Science All other relevant subjects in Advanced Environmental and Life Sciences					
Notes for textbook					
Supervisor will recommend textbooks and papers to students.					
Notes for reference					
Goals to be achieved					
To acquire basic knowledge on environmental and life sciences To understand the contents of scientific papers in a given field of environmental and life sciences To be able to make oral and poster presentations relevant to papers he/she has read.					
Evaluation of achievement					
The evaluation is based on the scores of reading papers, discussions, reports and presentations of his/her research in the seminar. His/her supervisor evaluates the scores.					
Examination					
その他 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					

(M44630050)Applied Physical Chemistry I[Applied Physical Chemistry I]

Subject name[English]	Applied Physical Chemistry I[Applied Physical Chemistry I]				
Schedule number	M44630050	Subject area	Advanced Environmental and Life Sciences	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Tue.4~4	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	松本 明彦 MATSUMOTO Akihiko				
Numbering					
Objectives of class					
<p>Intermolecular interaction plays a key role in interfacial characteristics such as a mechanical property of composite materials, adsorption and separation features of molecules by porous solids. This course deals with fundamental aspect of the composite materials and basic principle of the intermolecular interaction. The adsorption and separation phenomena are also implemented based on the molecular interaction.</p> <p>Intermolecular interaction plays a key role in interfacial characteristics such as a mechanical property of composite materials, adsorption and separation features of molecules by porous solids. This course deals with fundamental aspect of the composite materials and basic principle of the intermolecular interaction. The adsorption and separation phenomena are also implemented based on the molecular interaction.</p>					
Contents of class					
<p>[1] 1.Composite materials overview [2] (Continued) [3] 2.Formation of interface and interfacial free energy [4] 3.Molecular interaction 3-1 Electrostatic interaction, 3-2 Orientation interaction, [5] 3-3 Induced interaction 3-4 Dispersion interaction [6] 4.Adsorption and related phenomena [7] Control of interface interaction by regulation of the chemical structure of the interface [8] Examination</p> <p>[1] 1.Composite materials overview [2] (Continued) [3] 2.Formation of interface and interfacial free energy [4] 3.Molecular interaction 3-1 Electrostatic interaction, 3-2 Orientation interaction, [5] 3-3 Induced interaction 3-4 Dispersion interaction [6] 4.Adsorption and related phenomena [7] Control of interface interaction by regulation of the chemical structure of the interface [8] Examination</p>					
Self Preparation and Review					
Related subjects					
Basic understanding on physical chemistry is expected.					
Notes for textbook					
Reference handouts will be provided in the class.					
Reference handouts will be provided in the class.					
(Reference books)					
[For molecular interaction]					
1. Intermolecular and Surface Forces, 3rd Ed.: J. N. Israelachvili, Academic Press (2011).					
2. Interface chemistry: D. H. Everett, Basic Principles of Colloid Science, Royal Society of Chemistry(1988).					
3. Physical Chemistry of Surfaces, 7th Ed.: A. Adamson, Wiley-Interscience (1997), or its old edition.					

[For adsorption]

1. F. Rouquerol, J. Rouquerol and K.S.W. Sing, Adsorption by Powders and Porous solids, Academic Press (1999)

Reference1	Book title	Intermolecular and Surface Forces, 3rd Ed.			ISBN	
	Author	J. N. Israelachvili	Publisher	Academic Press	Publish year	2011
Reference2	Book title	Intermolecular and Surface Forces, Third Edition: Revised Third Edition			ISBN	978-0123919274
	Author	Jacob N. Israelachvili	Publisher	Academic Press	Publish year	2011
Reference3	Book title	Basic Principles of Colloid Science			ISBN	
	Author	D.H. Everett	Publisher	The Royal Society of Chemistry	Publish year	1988
Reference4	Book title	Physical Chemistry of Surfaces, 7th Ed.			ISBN	
	Author	A. Adamson	Publisher	Wiley-Interscience	Publish year	1977

Notes for reference

[For adsorption science]

1. S. Rowell, J.E. Shields, M.A. Thomas and M. Thommes, Characterization of Porous Solids and Powders, Surface Area, Pore Size and Density, Kluwer, 2004.
2. F. Rouquerol, J. Rouquerol, K.S.W. Sing, Adsorption by Powders and Porous solids, 2nd Ed., Academic Press (2015) or its old edition published in 1999.

Goals to be achieved

- 1) Understanding of basic structure and properties of composite materials
- 2) Understanding of molecular interaction
- 3) Understanding of basic colloid and adsorption science
- 1) Understanding of basic structure and properties of composite materials
- 2) Understanding of molecular interaction

Evaluation of achievement

- 30 % Homework report and/or Quiz, 70 % Final examination or report
- 30 % Homework report and/or Quiz, 70 % Final examination or report

Examination

定期試験を実施(対面)
Examination(Face to Face)

Details of examination

Other information

- A. Matsumoto: room # B-505, E-mail: aki*at*ens.tut.ac.jp (Please replace “*at*” to “@” when e-mailing)
- A. Matsumoto: room # B-505, E-mail: aki*at*ens.tut.ac.jp (Please replace “*at*” to “@” when e-mailing)

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(M44630100)Special Topics in Applied Organic Chemistry[Special Topics in Applied Organic Chemistry]

Subject name[English]	Special Topics in Applied Organic Chemistry[Special Topics in Applied Organic Chemistry]				
Schedule number	M44630100	Subject area	Advanced Environmental and Life Sciences	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Tue.5~5	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	岩佐 精二, 柴富 一孝 IWASA Seiji, SHIBATOMI Kazutaka				
Numbering					
Objectives of class 有機化学の分野で精密有機合成化学と有機金属化学の最先端の知識を習得する。 To provide you with a working knowledge of advanced synthesis of molecular materials.					
Contents of class 有機化学は、炭素骨格と水素のほか多彩な元素を含む有機分子を扱い、様々な分野に応用されている。ここでは、精密有機合成化学と有機金属化学に焦点を絞り、高度な最前線の知識を修得する。また融合分野の特別講義を行う。 第1回 動植物起源有機物質概説 第2回 逆合成解析と全合成 第3回 全合成：最近の実例、今後の課題 第4回 18 電子則、配位形式、触媒サイクル 第5回 試験 第6回 触媒反応の応用 第7回 医薬品の合成と反応(I) 第8回 医薬品の合成と反応(II) 第9回 試験 This course includes the detail of the most recent progress in modern synthetic application of catalysis, organometallics, and the total synthesis of natural products on the basis of retrosynthetic analysis. 1. Total synthesis of bioactive organic compounds. (Iwasa) 2. Advanced modern synthetic organic reactions using transition metals. (Iwasa) 3. Basic concept of oxidative addition and reductive elimination in catalytic cycles. (Iwasa) 4. Synthetic applications of asymmetric synthesis and asymmetric catalysts. (Iwasa) 5. Basic concept of Lewis acid catalyst and organocatalyst. (Shibatomi) 6. Advanced Lewis acid catalysis in organic synthesis. (Shibatomi) 7. Advanced organocatalysis in organic synthesis. (Shibatomi) 8. Organofluorine chemistry. (Shibatomi)					
Self Preparation and Review					
Related subjects 有機合成学、有機元素化学、有機反応化学特論 Subjects related to Organic Chemistry					
Notes for textbook 参考書 大学院講義 I, II 有機化学 1999, 野依 編 東京化学同人 遷移金属が拓く有機合成 1997, 辻 二郎 著 化学同人 Classics in Total Synthesis 1997 K.C. Nicolaou.; E.J. Sorensen. VCH No textbook is required. Some of information in WebCT will be help for your understanding on this course.					

Notes for reference**Goals to be achieved**

有機化合物の構造と反応性について

- (1) 逆合成解析と全合成を理解する。
- (2) 18 電子則を正確に理解する。
- (3) 不斉合成、不斉触媒を理解する。
- (4) 理解した概念を触媒サイクルに応用できる。
- (5) 医薬品合成の実際を概観する。

A firm understanding on catalyst, stereochemistry, reaction mechanism, and their application for the synthesis of molecular materials is achieved.

Evaluation of achievement

評価法: 定期試験2回・補習・レポート(40%+40%+10%+10%)で評価する。

評価基準: 原則的にすべての講義に出席したのものにつき、下記のように成績を評価する。

A: 達成目標をすべて達成し、かつ試験・補習・レポートの合計点(100点満点)が80点以上

B: 達成目標を3つ達成し、かつ試験・補習・レポートの合計点(100点満点)が65点以上

C: 達成目標を2つ達成し、かつ試験・補習・レポートの合計点(100点満点)が55点以上

The report on papers from scientific journals such as J.A.C.S and Angew. Chem. will be imposed.

A design of novel organic molecular material.

Examination

授業と定期試験(対面)

By Report

Details of examination**Other information**

岩佐(部屋): B-506, Tel: 内線 6817, E-mail: iwasa@ens.tut.ac.jp

<http://ens.tut.ac.jp/orgchem/>

For more information:

Seiji Iwasa: room (B-506), e-mail (iwasa@ens.tut.ac.jp)

Kazutaka Shibatomi: room (B-507), e-mail (shiba@ens.tut.ac.jp)

Reference URL

<http://www.tutms.tut.ac.jp/RESEARCH/iwasa.html>

<http://ens.tut.ac.jp/orgchem/>

<http://material.tutms.tut.ac.jp/STAFF/IWASA/index.html>, <http://ens.tut.ac.jp/orgchem/>

<http://www.siorchem.ens.tut.ac.jp/index.html>

Office hours

質問、意見等随時受けます。

anytime.

Relations to attainment objectives of learning and education**Key words**

不斉触媒、不斉合成、全合成、天然物

molecular catalyst, total synthesis, natural product, asymmetric synthesis, transition metal

(M44630110)Developmental Neuroscience[Developmental Neuroscience]

Subject name[English]	Developmental Neuroscience[Developmental Neuroscience]				
Schedule number	M44630110	Subject area	Advanced Environmental and Life Sciences	Required or elective	Elective
Time of starting a course	Spring2 term	Day of the week,period	Tue.2~2	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	吉田 祥子, 沼野 利佳 YOSHIDA Sachiko, NUMANO Rika				
Numbering					
Objectives of class					
Objective of class is to develop a new technology for detection of neuronal function in your brain. We deal with neuronal property and development of neuronal circuit, and discuss applicability and problem of your ideas. Objective of class is to develop a new technology for detection of neuronal function in your brain. We deal with neuronal property and development of neuronal circuit, and discuss applicability and problem of your ideas.					
Contents of class					
S Yoshida, (1)Properties of neuronal cells (2)Electrical function and ion transport (3)Chemical information transport (4)Development of neuronal circuit (5)Detection of chemical information (6)Detection of electrical information (7)Detection of cortical development					
R Numano, (8)Neural inducer in vertebrates (9)Notch and Delta genes (10)Polarity and Segmentation (11)Hox gene function in the nervous system (12)Genesis and Migration (13)Cerebral cortex histogenesis (14)Topic1 (15)Topic2 & Discussion					
S Yoshida, (1)Properties of neuronal cells (2)Electrical function and ion transport (3)Chemical information transport (4)Development of neuronal circuit (5)Detection of chemical information (6)Detection of electrical information (7)Detection of cortical development					
R Numano, (8)Neural inducer in vertebrates (9)Notch and Delta genes (10)Polarity and Segmentation (11)Hox gene function in the nervous system (12)Genesis and Migration (13)Cerebral cortex histogenesis (14)Topic1 (15)Topic2 & Discussion					
Self Preparation and Review					
Related subjects					

A firm understanding on fundamental biochemistry and thermodynamics will be necessary.
A firm understanding on fundamental biochemistry and thermodynamics will be necessary.

Notes for textbook

Web-based text will be distributed.

(Reference)

From Neuron To Brain 4th Ed, Nicholls et. al. (Sinauer, 2001)

Web-based text will be distributed.

(Reference)

From Neuron To Brain 4th Ed, Nicholls et. al. (Sinauer, 2001)

Notes for reference

Goals to be achieved

Evaluation of achievement

Dr. Yoshida

Short reports on Web; 40%, Term report; 60%

Dr. Numano

Term report; 100%

Short reports on Web; 40%, Term report; 60%

Term report; 100%

Examination

レポートで実施

By Report

Details of examination

Other information

S Yoshida

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

R Numano

Room: G-407, E-mail:numano@tut.jp

S Yoshida

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

R Numano

Room: G-407, E-mail:numano@tut.jp

Reference URL

<https://moodle.imc.tut.ac.jp/>

<https://moodle.imc.tut.ac.jp/>

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Advanced Electrical and Electronic Technology for Ecological Engineering[Advanced Electrical and Electronic Technology for Ecological Engineering]				
Schedule number	M44630140	Subject area	Advanced Environmental and Life Sciences	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Fri.4~4	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	田中 三郎,高島 和則,有吉 誠一郎 TANAKA Saburo, TAKASHIMA Kazunori, ARIYOSHI Seiichiro				
Numbering					
Objectives of class					
This lecture provides a comprehensive overview of the important technologies for photon detection from the millimeter-wave through the ultraviolet spectral regions.					
This lecture provides a comprehensive overview of the important technologies for photon detection from the millimeter-wave through the ultraviolet spectral regions.					
Contents of class					
Attendance students read the recommendation reference book 1 in advance and give presentation in a seminar form about any of the following topics.					
<ol style="list-style-type: none"> 1. Introduction 2. Intrinsic photoconductors 3. Extrinsic photoconductors 4. Photodiodes and other junction-based detectors 5. Amplifiers and readouts 6. Arrays 7. Photoemissive detectors 8. Photography 9. Bolometers and other thermal detectors 10. Visible and infrared coherent receivers 11. Submillimeter- and millimeter-wave heterodyne receivers 					
Attendance students read the recommendation reference book 1 in advance and give presentation in a seminar form about any of the following topics.					
<ol style="list-style-type: none"> 1. Introduction 2. Intrinsic photoconductors 3. Extrinsic photoconductors 4. Photodiodes and other junction-based detectors 5. Amplifiers and readouts 6. Arrays 7. Photoemissive detectors 8. Photography 9. Bolometers and other thermal detectors 10. Visible and infrared coherent receivers 11. Submillimeter- and millimeter-wave heterodyne receivers 					
Self Preparation and Review					
Related subjects					
Notes for textbook					
References are distributed as needed.					
References are distributed as needed.					
Reference1	Book title	Detection of Light		ISBN	0 521 81636

	Author	George Rieke	Publisher	Cambridge University Press	Publish year	X 2003
Notes for reference						
Goals to be achieved						
Evaluation of achievement						
[Evaluation basis]						
Students who attend all classes basically will be evaluated as follows:						
A: Achieved 80 % of goals and obtained total points of presentation and reports, 80 or higher (out of 100 points).						
B: Achieved 65 % of goals and obtained total points of presentation and reports, 65 or higher (out of 100 points).						
C: Achieved 55 % of goals and obtained total points of presentation and reports, 55 or higher (out of 100 points).						
[Evaluation basis]						
Students who attend all classes basically will be evaluated as follows:						
A: Achieved 80 % of goals and obtained total points of presentation and reports, 80 or higher (out of 100 points).						
B: Achieved 65 % of goals and obtained total points of presentation and reports, 65 or higher (out of 100 points).						
C: Achieved 55 % of goals and obtained total points of presentation and reports, 55 or higher (out of 100 points).						
Examination						
レポートで実施 By Report						
Details of examination						
Other information						
Seiichiro Ariyoshi, Office: G-404 (phone 6908), E-mail: ariyoshi@ens.tut.ac.jp						
Sabro Tanaka, Office: G-605 (phone 6916), E-mail: tanakas@ens.tut.ac.jp						
Kazunori Takashima, Office: G-310 (phone 6921), E-mail: takashima@ens.tut.ac.jp						
Seiichiro Ariyoshi, Office: G-404 (phone 6908), E-mail: ariyoshi@ens.tut.ac.jp						
Sabro Tanaka, Office: G-605 (phone 6916), E-mail: tanakas@ens.tut.ac.jp						
Kazunori Takashima, Office: G-310 (phone 6921), E-mail: takashima@ens.tut.ac.jp						
Reference URL						
http://ens.tut.ac.jp/squid/						
http://ens.tut.ac.jp/squid/						
Office hours						
Relations to attainment objectives of learning and education						
Key words						

(M44630180)Advanced Reaction Engineering[Advanced Reaction Engineering]

Subject name[English]	Advanced Reaction Engineering[Advanced Reaction Engineering]				
Schedule number	M44630180	Subject area	Advanced Environmental and Life Sciences	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Tue.2~2	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	小口 達夫 OGUCHI Tatsuo				
Numbering					
Objectives of class					
<p>This course will provide students with the opportunity to understand the basic reaction kinetics and dynamics. Especially, experimental and theoretical treatment of reaction rate constants will be given. Some reaction mechanisms in combustion or atmosphere will be also discussed.</p> <p>This course will provide students with the opportunity to understand the basic reaction kinetics and dynamics. Especially, experimental and theoretical treatment of reaction rate constants will be given. Some reaction mechanisms in combustion or atmosphere will be also discussed.</p>					
Contents of class					
<p>1. Introduction. 2. Chemical reaction and rate theory. 3. Reaction mechanism. 4. Thermodynamics of reaction. 5. Reaction rate theory. (1) 6. Reaction rate theory. (2) 7. Summary</p> <p>1. Introduction. 2. Chemical reaction and rate theory. 3. Reaction mechanism. 4. Thermodynamics of reaction. 5. Reaction rate theory. (1) 6. Reaction rate theory. (2) 7. Summary</p>					
Self Preparation and Review					
Related subjects					
Notes for textbook					
(Reference book) Paul L. Houston, "Chemical Kinetics and Reaction Dynamics", McGrawHill.					
(A study-aid book) Steingfeld, Francisco, and Hase, "Chemical Kinetics and Dynamics", Prentice-hall, 1989.					
(Reference book) Paul L. Houston, "Chemical Kinetics and Reaction Dynamics", McGrawHill.					
(A study-aid book) Steingfeld, Francisco, and Hase, "Chemical Kinetics and Dynamics", Prentice-hall, 1989.					
Notes for reference					
Goals to be achieved					
Understanding reaction rate theory, reaction mechanisms.					
Understanding reaction rate theory, reaction mechanisms.					

Evaluation of achievement Grades for the course will be based on the reports. Grades for the course will be based on the reports.
Examination レポートで実施 By Report
Details of examination
Other information Tatsuo Oguchi, Phone:6930
Reference URL
Office hours Any time, but e-mail is required in advance. Any time, but e-mail is required in advance.
Relations to attainment objectives of learning and education Physical chemistry and thermodynamics. Physical chemistry and thermodynamics.
Key words Reaction, Rate Theory, Transition State Theory, Lindemann Mechanism. Reaction, Rate Theory, Transition State Theory, Lindemann Mechanism.

(M44630190)Advanced Sustainable Coordinator[Advanced Sustainable Coordinator]

Subject name[English]	Advanced Sustainable Coordinator[Advanced Sustainable Coordinator]				
Schedule number	M44630190	Subject area	Advanced Environmental and Life Sciences	Required or elective	Elective
Time of starting a course	Spring2 term	Day of the week,period	Fri.4~4	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Begging grade	M1, M2
Charge teacher name[Roman alphabet mark]	後藤 尚弘, 東海林 孝幸 GOTOH Naohiro, TOKAIRIN Takayuki				
Numbering					
Objectives of class					
Goto					
To establish a "Sustainable Society" is one of major fields for sustainable development. Countermeasures for it should be comprehensive and they comprise not only engineering but also several disciplines. The objectives of this class are					
1 to comprehend notion of "Sustainable Society"					
2 to learn human dimensional disciplines for "Sustainable Society"					
3 to know planning method to establish "Sustainable Society" though examples					
Tokairin					
The objectives of this class are					
1 to know air pollution situation					
2 to understand the evaluation method of pollutant concentration					
3 to understand the characteristics of planetary boundary layer					
Goto					
To establish a "Sustainable Society" is one of major fields for sustainable development. Countermeasures for it should be comprehensive and they comprise not only engineering but also several disciplines. The objectives of this class are					
1 to comprehend notion of "Sustainable Society"					
2 to learn human dimensional disciplines for "Sustainable Society"					
3 to know planning method to establish "Sustainable Society" though examples					
Tokairin					
The objectives of this class are					
1 to know air pollution situation					
2 to understand the evaluation method of pollutant concentration					
3 to understand the characteristics of planetary boundary layer					
Contents of class					
Goto					
1 Concept of Sustainable development					
2 Material (Substance) flow analysis and Life Cycle Assessment					
3 Japanese environmental law and institution					
Tokairin					
1 Atmospheric environment and air pollution					
2 Atmospheric diffusion modeling					
3 Meteorology of planetary boundary layer					
Goto					
1 Concept of Sustainable development					
2 Material (Substance) flow analysis and Life Cycle Assessment					
3 Japanese environmental law and institution					
Tokairin					
1 Atmospheric environment and air pollution					

2 Atmospheric diffusion modeling
3 Meteorology of planetary boundary layer

Self Preparation and Review

Related subjects

Notes for textbook

Goto

I will distribute copies of document.

Tokairin

I will distribute copies of document.

Goto

I will distribute copies of document.

Tokairin

I will distribute copies of document.

Notes for reference

Goals to be achieved

Goto

to understand how to establish sustainable society

Tokairin

to understand basics on atmospheric environment and its evaluation method.

Goto

to understand how to establish sustainable society

Tokairin

to understand basics on atmospheric environment and its evaluation method.

Evaluation of achievement

Every week and Term end report (100%)

Every week and Term end report (100%)

Examination

レポートで実施

By Report

Details of examination

Other information

Naohiro Goto (G603) goto@ens.tut.ac.jp

Takayuki Tokairin (G405) tokairin@ens.tut.ac.jp

Naohiro Goto (G603) goto@ens.tut.ac.jp

Takayuki Tokairin (G405) tokairin@ens.tut.ac.jp

Reference URL

Office hours

Any time by E-mail
Any time by E-mail

Relations to attainment objectives of learning and education

Key words

Sustainability, MFA, LCA, Air pollution, planetary boundary layer, Atmospheric diffusion
Sustainability, MFA, LCA, Air pollution, planetary boundary layer, Atmospheric diffusion

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

Subject name[English]	Advanced Supercritical Fluid Engineering[Advanced Supercritical Fluid Engineering]				
Schedule number	M44630200	Subject area	Advanced Environmental and Life Sciences	Required or elective	Elective
Time of starting a course	Spring2 term	Day of the week,period	Fri.2~2	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	大門 裕之 DAIMON Hiroyuki				
Numbering					
Objectives of class					
Based on Supercritical Fluid Engineering and Environmental Chemical Engineering, practical philosophy, creativity and leadership of engineer are improved during this course. The topics are mainly waste management and utilization of biomass. Environmental issue is widely discussed to obtain the knowledge and organizing skill of comprehensive process or society. Based on Supercritical Fluid Engineering and Environmental Chemical Engineering, practical philosophy, creativity and leadership of engineer are improved during this course. The topics are mainly waste management and utilization of biomass. Environmental issue is widely discussed to obtain the knowledge and organizing skill of comprehensive process or society.					
Contents of class					
1st Summary 2nd History 3rd Physical property 1 4th Physical property 2 5th Instrumentation and process engineering 6th Application of Supercritical Water Technologies 1 7th Application of Supercritical Water Technologies 2 8th Application of Supercritical Water Technologies 3 9th Application of Supercritical Water Technologies 4 10th Application of Supercritical Water Technologies 5 11th Application of Supercritical Carbon dioxide Technologies 1 12th Application of Supercritical Carbon dioxide Technologies 2 13th Application of Supercritical Carbon dioxide Technologies 3 14th Application of Supercritical Carbon dioxide Technologies 4 15th Examination 1st Summary 2nd History 3rd Physical property 1 4th Physical property 2 5th Instrumentation and process engineering 6th Application of Supercritical Water Technologies 1 7th Application of Supercritical Water Technologies 2 8th Application of Supercritical Water Technologies 3 9th Application of Supercritical Water Technologies 4 10th Application of Supercritical Water Technologies 5 11th Application of Supercritical Carbon dioxide Technologies 1 12th Application of Supercritical Carbon dioxide Technologies 2 13th Application of Supercritical Carbon dioxide Technologies 3 14th Application of Supercritical Carbon dioxide Technologies 4 15th Examination					
Self Preparation and Review					
Related subjects					
Advanced Analytical Separation Chemistry, Advanced Industrial Ecology Advanced Analytical Separation Chemistry, Advanced Industrial Ecology					
Notes for textbook					
1. Analytical Supercritical Fluid Chromatography and Extraction edited by M. L. Lee and K. E. Markides, 1990					

Chromatography Conference, Inc.
2. Hyphenated Techniques in Supercritical Fluid Chromatography and Extraction
edited by K. Jinno, 1992
Elsevier
1. Analytical Supercritical Fluid Chromatography and Extraction
edited by M. L. Lee and K. E. Markides, 1990
Chromatography Conference, Inc.
2. Hyphenated Techniques in Supercritical Fluid Chromatography and Extraction
edited by K. Jinno, 1992
Elsevier

Notes for reference

Goals to be achieved

1. To understand Supercritical Fluid Technology
 2. To improve engineering skill
 3. To obtain the knowledge about Environmental problem especially for waste management
1. To understand Supercritical Fluid Technology
 2. To improve engineering skill
 3. To obtain the knowledge about Environmental problem especially for waste management

Evaluation of achievement

Based on Presentation and Interview during class

More than

80% ; A

65% ; B

55% ; C

Based on Presentation and Interview during class

More than

80% ; A

65% ; B

55% ; C

Examination

レポートで実施

By Report

Details of examination

Other information

Office : Building G, Floor 6th, Room 602

Tel:0532-44-6905

Email:daimon@ens.tut.ac.jp

Office : Building G, Floor 6th, Room 602

Tel:0532-44-6905

Email:daimon@ens.tut.ac.jp

Reference URL

<http://water.eco.tut.ac.jp/class.html> (English version under construction)

<http://water.eco.tut.ac.jp/class.html> (English version under construction)

Office hours

After the class or anytime when you make an appointment through Email

After the class or anytime when you make an appointment through Email

Relations to attainment objectives of learning and education

(D)

(D)

Key words

Supercritical Fluids, Resource Recovery, Material and Energy Balance, Process Engineering

Supercritical Fluids, Resource Recovery, Material and Energy Balance, Process Engineering

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

Subject name[English]	Advanced Life Science and Biotechnology II[Advanced Life Science and Biotechnology II]				
Schedule number	M44630220	Subject area	Advanced Environmental and Life Sciences	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering					
Objectives of class	This course will provide the students with the opportunity to study on the selected subject in the realm of further advanced life science and biotechnology based on the knowledge of the course of Advanced Life Science and Biotechnology I.				
Contents of class	The classes will be given by his/her supervisor. The type and contents of this course depend on his/her supervisor.				
Self Preparation and Review					
Related subjects	Advanced Life Science and Biotechnology I				
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement	The evaluation is based on the scores of reports, presentations, and examination.				
Examination	その他 None during exam period				
Details of examination					
Other information	Supervisor				
Reference URL					
Office hours	Students are encouraged visiting by appointment.				
Relations to attainment objectives of learning and education					
Key words	Molecular biology and microbiology, genomics, biotechnology and bioengineering				

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

Subject name[English]	Advanced Environmental Technology II[Advanced Environmental Technology II]				
Schedule number	M44630240	Subject area	Advanced Environmental and Life Sciences	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering					
Objectives of class	This course will provide the students with the opportunity to study on the selected subject in the realm of further advanced environmental technology based on the knowledge of the course of Advanced Environmental Technology I.				
Contents of class	The classes will be given by his/her supervisor. The type and contents of this course depend on his/her supervisor.				
Self Preparation and Review					
Related subjects	Advanced Environmental Technology I				
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement	The evaluation is based on the scores of reports, presentations, and examination.				
Examination	その他 None during exam period				
Details of examination					
Other information	Supervisor				
Reference URL					
Office hours	Students are encouraged visiting by appointment.				
Relations to attainment objectives of learning and education					
Key words					

(M44630260)Advanced Environmental and Ecological Systems II[Advanced Environmental and Ecological Systems II]

Subject name[English]	Advanced Environmental and Ecological Systems II[Advanced Environmental and Ecological Systems II]				
Schedule number	M44630260	Subject area	Advanced Environmental and Life Sciences	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Begining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering					
Objectives of class					
This course will provide the students with the opportunity to study on the selected subject in the realm of further advanced environmental and ecological systems based on the knowledge of the course of Advanced Environmental and Ecological Systems I.					
Contents of class					
The classes will be given by his/her supervisor. The type and contents of this course depend on his/her supervisor.					
Self Preparation and Review					
Related subjects					
Advanced Environmental and Ecological Systems I					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
The evaluation is based on the scores of reports, presentations, and examination.					
Examination					
その他 None during exam period					
Details of examination					
Other information					
Supervisor					
Reference URL					
Office hours					
Students are encouraged visiting by appointment.					
Relations to attainment objectives of learning and education					
Key words					

(M44630280)X-ray Spectroscopy for Catalytic Engineering[X-ray Spectroscopy for Catalytic Engineering]

Subject name[English]	X-ray Spectroscopy for Catalytic Engineering[X-ray Spectroscopy for Catalytic Engineering]				
Schedule number	M44630280	Subject area	Advanced Environmental and Life Sciences	Required or elective	Elective
Time of starting a course	Spring2 term	Day of the week,period	Tue.3~3	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	水嶋 生智 MIZUSHIMA Takanori				
Numbering					
Objectives of class					
To gain knowledge of X-ray spectroscopic techniques including X-ray diffraction, X-ray absorption fine structure (XAFS), and fluorescent X-ray spectroscopy as analytical tools for solid catalysts.					
To gain knowledge of X-ray spectroscopic techniques including X-ray diffraction, X-ray absorption fine structure (XAFS), and fluorescent X-ray spectroscopy as analytical tools for solid catalysts.					
Contents of class					
(1) Fundamentals of X-ray and its spectroscopy					
(2) Principle, measurement, and application of X-ray diffraction					
(3) Experimental practice of X-ray diffraction					
(4) Principle, measurement, and analysis of XAFS					
(5) Application of XAFS to catalyst characterization					
(6) Advanced XAFS techniques and their applications					
(7) Principle, measurement, and application of fluorescent X-ray spectroscopy					
(1) Fundamentals of X-ray and its spectroscopy					
(2) Principle, measurement, and application of X-ray diffraction					
(3) Experimental practice of X-ray diffraction					
(4) Principle, measurement, and analysis of XAFS					
(5) Application of XAFS to catalyst characterization					
(6) Advanced XAFS techniques and their applications					
(7) Principle, measurement, and application of fluorescent X-ray spectroscopy					
Self Preparation and Review					
Related subjects					
It is advisable to have basic knowledge of physical and inorganic chemistry.					
It is advisable to have basic knowledge of physical and inorganic chemistry.					
Notes for textbook					
No textbook is required. A printed synopsis of the class will be given.					
(Reference)					
Y.Iwasawa et al., "X-ray absorption fine structure for catalysts and surfaces", World Scientific					
No textbook is required. A printed synopsis of the class will be given.					
(Reference)					
Y.Iwasawa et al., "X-ray absorption fine structure for catalysts and surfaces", World Scientific					
Notes for reference					
Goals to be achieved					
(1) Understanding of basics of X-ray spectroscopy					
(2) Understanding of X-ray diffraction, XAFS, and fluorescent X-ray spectroscopy as analytical tools for solid catalysts.					
(1) Understanding of basics of X-ray spectroscopy					
(2) Understanding of X-ray diffraction, XAFS, and fluorescent X-ray spectroscopy as analytical tools for solid catalysts.					

<p>Evaluation of achievement Reports 100% Reports 100%</p>
<p>Examination レポートで実施 By Report</p>
<p>Details of examination</p>
<p>Other information Takanori Mizushima, room : B-303, e-mail: mizushima@ens.tut.ac.jp Takanori Mizushima, room : B-303, e-mail: mizushima@ens.tut.ac.jp</p>
<p>Reference URL</p>
<p>Office hours Anytime Anytime</p>
<p>Relations to attainment objectives of learning and education</p>
<p>Key words X-ray spectroscopy, X-ray diffraction, XAFS, Fluorescent X-ray spectroscopy, Solid catalysts X-ray spectroscopy, X-ray diffraction, XAFS, Fluorescent X-ray spectroscopy, Solid catalysts</p>

(M44630290)Advanced Biomaterials Engineering[Advanced Biomaterials Engineering]

Subject name[English]	Advanced Biomaterials Engineering[Advanced Biomaterials Engineering]				
Schedule number	M44630290	Subject area	Advanced Environmental and Life Sciences	Required or elective	Elective
Time of starting a course	Spring2 term	Day of the week,period	Thu.3~3	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	辻 秀人, 手老 龍吾 TSUJI Hideto, TERO Ryugo				
Numbering					
Objectives of class					
<p>Biomaterials have been developed and studied in terms of various applications including biomedical, pharmaceutical and environmental applications. This course covers the fundamentals and applications of biomaterials and related experimental techniques.</p> <p>Biomaterials have been developed and studied in terms of various applications including biomedical, pharmaceutical and environmental applications. This course covers the fundamentals and applications of biomaterials and related experimental techniques.</p>					
Contents of class					
<p>This course deals with all aspects of biobased and biodegradable polymers for biomedical, pharmaceutical, and environmental applications, and of devices and techniques for sensing biomolecules. The detailed course schedule is shown below. The detailed course schedule is shown below.</p> <p>Biobased and biodegradable polymers (Hideto Tsuji): (1) introduction, synthesis, and structures, (2) molding, crystallization, and physical properties, (3) hydrolytic degradation and biodegradation, and (4) applications.</p> <p>Biodevice and biosensing (Ryugo Tero): (5) introduction of biomaterials and biodevices, (6) detection of cell membrane functions, (7) surface patterning and microarray, and (8) imaging techniques for biomolecules.</p> <p>This course deals with all aspects of biobased and biodegradable polymers for biomedical, pharmaceutical, and environmental applications, and of devices and techniques for sensing biomolecules. The detailed course schedule is shown below. The detailed course schedule is shown below.</p> <p>Biobased and biodegradable polymers (Hideto Tsuji): (1) introduction, synthesis, and structures, (2) molding, crystallization, and physical properties, (3) hydrolytic degradation and biodegradation, and (4) applications.</p> <p>Biodevice and biosensing (Ryugo Tero): (5) introduction of biomaterials and biodevices, (6) detection of cell membrane functions, (7) surface patterning and microarray, and (8) imaging techniques for biomolecules.</p>					
Self Preparation and Review					
<p>If possible, read the reference book chapters which are shown below and you can find them in the university library (Hideto Tsuji). Read the appropriate chapter(s) of the reference book (#3) shown below. You can access it in the university network. (Ryugo Tero)</p> <p>If possible, read the reference book chapters which are shown below and you can find them in the university library (Hideto Tsuji). Read the appropriate chapter(s) of the reference book (#3) shown below. You can access it in the university network. (Ryugo Tero)</p>					
Related subjects					
Notes for textbook					
Printed materials will be distributed (Hideto Tsuji).					

Printed materials will be distributed as necessary (Ryugo Tero).

Printed materials will be distributed (Hideto Tsuji).

Printed materials will be distributed as necessary (Ryugo Tero).

Reference1	Book title	Degradation of Poly (Lactide)-Based Biodegradable Materials			ISBN	1604565020
	Author	Hideto Tsuji	Publisher	Nova Science Pub Inc	Publish year	2008
Reference2	Book title	Chapter 21 in "Poly(lactic acid): Synthesis, Structures, Properties, Processing, and Applications"			ISBN	0470293667
	Author	Hideto Tsuji	Publisher	Wiley	Publish year	2010
Reference3	Book title	Nanoscience: Nanobiotechnology and Nanobiology			ISBN	978-3-540-88633-4
	Author	Patrick Boisseau & Marcel Lahmani	Publisher	Springer	Publish year	2009

Notes for reference

Reference book 3 (Ryugo Tero):

<http://link.springer.com/book/10.1007%2F978-3-642-28030-6>

Reference book 3 (Ryugo Tero):

<http://link.springer.com/book/10.1007%2F978-3-642-28030-6>

Goals to be achieved

To understand the fundamentals and applications of biobased and biodegradable polymers (Hideto Tsuji).

To understand the fundamentals and applications of biodevice, biosensing and related methods (Ryugo Tero).

To understand the fundamentals and applications of biobased and biodegradable polymers (Hideto Tsuji).

To understand the fundamentals and applications of biodevice, biosensing and related methods (Ryugo Tero).

Evaluation of achievement

Presentation (100%) regarding the biobased and biodegradable polymers (Hideto Tsuji)

Reporting assignment (100%) which will be given in each class (Ryugo Tero)

Presentation (100%) regarding the biobased and biodegradable polymers (Hideto Tsuji)

Reporting assignment (100%) which will be given in each class (Ryugo Tero)

Examination

レポートで実施

By Report

Details of examination

Presentation (Hideto Tsuji)

Reporting assignment (Ryugo Tero)

Presentation (Hideto Tsuji)

Reporting assignment (Ryugo Tero)

Other information

Room (G-606), e-mail (tsuji@ens.tut.ac.jp), phone: 6922 (Hideto Tsuji)

Room (B-405), e-mail (tero@tut.jp), phone: 6791 (Ryugo Tero)

Room (G-606), e-mail (tsuji@ens.tut.ac.jp), phone: 6922 (Hideto Tsuji)

Room (B-405), e-mail (tero@tut.jp), phone: 6791 (Ryugo Tero)

Reference URL

Office hours

Immediately after the class (Hideto Tsuji)

After the class, or as needed in my office (Ryugo Tero)

Immediately after the class (Hideto Tsuji)

After the class, or as needed in my office (Ryugo Tero)

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Seminar on Architecture and Civil Engineering I[Seminar on Architecture and Civil Engineering I]				
Schedule number	M45610010	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	3
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S5系教務委員, 5系各教員 5kei kyomu iin-S, 5kei kakukyoin				
Numbering					
Objectives of class	All the students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.				
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement	Report				
Examination	その他 By Report				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Seminar on Architecture and Civil Engineering II[Seminar on Architecture and Civil Engineering II]				
Schedule number	M45610020	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	3
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Architecture and Civil Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S5系教務委員, 5系各教員 5kei kyomu iin-S, 5kei kakukyoin				
Numbering					
Objectives of class	All the students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.				
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement	Report				
Examination	その他 By Report				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives 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[Thesis Research on Architecture and Civil Engineering]				
Schedule number	M45610030	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~2
Department Offered	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S5系教務委員, 5系各教員 5kei kyomu iin-S, 5kei kakukyoin				
Numbering					
Objectives of class	Research on architecture and civil engineering				
Contents of class	It depends on the laboratory. All students must present their thesis at the end of the course and take a final examination on the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor.				
Self Preparation and Review					
Related subjects	It depends on the laboratory				
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement	Evaluation is based on report.				
Examination	その他 By Report				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives 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[Thesis Research on Architecture and Civil Engineering]				
Schedule number	M45610030	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S5系教務委員, 5系各教員 5kei kyomu iin-S, 5kei kakukyoin				
Numbering					
Objectives of class	This thesis research on architecture and civil engineering is designated to deepen the knowledge and enhance the skills of the students in their research fields through the self-oriented endeavour with the instruction of his/her supervisor(s).				
Contents of class	The subjects and the contents of the thesis vary depending on the laboratory. All students must present their thesis at the end of the course and take a final examination on the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor(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 preparation and presentation of the thesis.				
Examination	その他 By Report				
Details of examination					
Other information	Refer to administration office.				
Reference URL	Refer to the URL of each laboratory				
Office hours	Refer to administration office.				
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]				
Schedule number	M4561003T	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Architecture and Civil Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering					
Objectives of class	This thesis research on architecture and civil engineering is designated to deepen the knowledge and enhance the skills of the students in their research fields through the self-oriented endeavour with the instruction of his/her supervisor(s).				
Contents of class	The subjects and the contents of the thesis vary depending on the laboratory. All students must present their thesis at the end of the course and take a final examination on the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor(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 preparation and presentation of the thesis.				
Examination	その他 By Report				
Details of examination					
Other information	Refer to administration office.				
Reference URL	Refer to the URL of each laboratory				
Office hours	Refer to administration office.				
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Seminar on Architecture and Civil Engineering[Seminar on Architecture and Civil Engineering]				
Schedule number	M45610040	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Architecture and Civil Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S5系教務委員, 5系各教員 5kei kyomu iin-S, 5kei kakukyoin				
Numbering					
Objectives of class	All the students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.				
Contents of class	In each seminar, students pursue several research topics and/or undertake projects collectively and solely under the instruction of the faculty members of the department and/or those of other departments.				
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement	Report				
Examination	その他 By Report				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(M45630030)Seismic Evaluation of Existing Buildings[Seismic Evaluation of Existing Buildings]

Subject name[English]	Seismic Evaluation of Existing Buildings[Seismic Evaluation of Existing Buildings]				
Schedule number	M45630030	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Tue.3~3	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Begging grade	M1, M2
Charge teacher name[Roman alphabet mark]	松井 智哉 MATSUI Tomoya				
Numbering					
Objectives of class					
<p>This course is intended to introduce the Japanese seismic evaluation method for existing buildings, in particular, reinforced concrete buildings. The concept and procedures of this method are outlined in this course, to gain advanced knowledge to evaluate seismic performance of existing buildings.</p> <p>This course is intended to introduce the Japanese seismic evaluation method for existing buildings, in particular, reinforced concrete buildings. The concept and procedures of this method are outlined in this course, to gain advanced knowledge to evaluate seismic performance of existing buildings.</p>					
Contents of class					
1: Introduction 2: Procedure of Seismic Evaluation 3: Seismic Index of Structure: IS 4: Irregularity and Time Indexes: SD and T 5: First Level Screening Procedure 6: Second Level Screening Procedure –Basic Seismic Index of Structure: E0– 7: Second Level Screening Procedure –Strength Index: C– 8: Second Level Screening Procedure –Ductility Index: F– 9: Judgment on Seismic Safety 10: Recent Earthquake Disasters 11: Introduction of Seismic Retrofit 12: Observation of Retrofitted Buildings 13: Observation of Structural Testing 14: Explanation on Assignments 1: Introduction 2: Procedure of Seismic Evaluation 3: Seismic Index of Structure: IS 4: Irregularity and Time Indexes: SD and T 5: First Level Screening Procedure 6: Second Level Screening Procedure –Basic Seismic Index of Structure: E0– 7: Second Level Screening Procedure –Strength Index: C– 8: Second Level Screening Procedure –Ductility Index: F– 9: Judgment on Seismic Safety 10: Recent Earthquake Disasters 11: Introduction of Seismic Retrofit 12: Observation of Retrofitted Buildings 13: Observation of Structural Testing 14: Explanation on Assignments					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Standard for Seismic Evaluation of Existing Reinforced Concrete Buildings, 2001 Standard for Seismic Evaluation of Existing Reinforced Concrete Buildings, 2001					
Notes for reference					

Goals to be achieved

To understand nonlinear structural mechanics through learning the Japanese seismic evaluation method for existing buildings.

To understand nonlinear structural mechanics through learning the Japanese seismic evaluation method for existing buildings.

Evaluation of achievement

Report

- A 80 to 100

- B 65 to 79

- C 55 to 64

Report

- A 80 to 100

- B 65 to 79

- C 55 to 64

Examination

レポートで実施

By Report

Details of examination**Other information**

Room: D-807

E-mail: matsui@ace.tut.ac.jp

Room: D-807

E-mail: matsui@ace.tut.ac.jp

Reference URL

<http://rc.ace.tut.ac.jp/matsui/index.html>

<http://rc.ace.tut.ac.jp/matsui/index.html>

Office hours

Wednesday 14:00-17:00

Wednesday 14:00-17:00

Relations to attainment objectives of learning and education**Key words**

(M45630060)Building Science: Indoor Air Quality and Ventilation[Building Science: Indoor Air Quality and Ventilation]

Subject name[English]	Building Science: Indoor Air Quality and Ventilation[Building Science: Indoor Air Quality and Ventilation]				
Schedule number	M45630060	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Wed.2~2	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	松本 博 MATSUMOTO Hiroshi				
Numbering					
Objectives of class					
<p>This course aims at providing the practical strategies to realize a good air environment, mainly indoor air quality and ventilation in buildings. The goal is to help professionals update their knowledge related to new techniques and methods on indoor climate and its control.</p> <p>This course aims at providing the practical strategies to realize a good air environment, mainly indoor air quality and ventilation in buildings. The goal is to help professionals update their knowledge related to new techniques and methods on indoor climate and its control.</p>					
Contents of class					
<p>The course is offered as an introduction to a professional-level understanding of indoor air quality control and ventilation method for realizing a good air environment in buildings. The course consists of the following topics:</p> <ol style="list-style-type: none"> 1. General Introduction to indoor air environment 2. Building related illness and indoor air quality 3. Physical/chemical characteristics of air quality 4. Measurement techniques of air pollutants 5. Modeling of material emission and sorption 6. Prediction method for indoor air quality (IAQ) in rooms 7. CFD analysis of air movement 8. Performance evaluation of ventilation systems 9. Ventilation system design for pollutant control 10. Guidelines, codes and standard 11. Research and Development on IAQ (1) 12. Research and Development on IAQ (2) 13. Research and Development on IAQ (3) 14. Discussion on IAQ related issues 15. Supplementary lecture <p>The course is offered as an introduction to a professional-level understanding of indoor air quality control and ventilation method for realizing a good air environment in buildings. The course consists of the following topics:</p> <ol style="list-style-type: none"> 1. General Introduction to indoor air environment 2. Building related illness and indoor air quality 3. Physical/chemical characteristics of air quality 4. Measurement techniques of air pollutants 5. Modeling of material emission and sorption 6. Prediction method for indoor air quality (IAQ) in rooms 7. CFD analysis of air movement 8. Performance evaluation of ventilation systems 9. Ventilation system design for pollutant control 10. Guidelines, codes and standard 11. Research and Development on IAQ (1) 12. Research and Development on IAQ (2) 13. Research and Development on IAQ (3) 14. Discussion on IAQ related issues 15. Supplementary lecture 					
Self Preparation and Review					

Related subjects
Notes for textbook The related handouts will be distributed. The related handouts will be distributed.
Notes for reference
Goals to be achieved Achievement level of this course is to understand the background of sick building syndrome and the practical strategies to realize a good air environment by controlling indoor air quality and ventilation in buildings, and also propose the healthy and sustainable buildings. Achievement level of this course is to understand the background of sick building syndrome and the practical strategies to realize a good air environment by controlling indoor air quality and ventilation in buildings, and also propose the healthy and sustainable buildings.
Evaluation of achievement Reports related to this subject are reviewed to evaluate the achievement level. Reports related to this subject are reviewed to evaluate the achievement level.
Examination レポートで実施 By Report
Details of examination
Other information Room: D-710, Phone: ext. 6838, E-mail: matsu@ace.tut.ac.jp Room: D-710, Phone:6838, Email: matsu@ace.tut.ac.jp
Reference URL http://einstein.ace.tut.ac.jp/ http://einstein.ace.tut.ac.jp/
Office hours Thursday 13:00-14:30 Thursday 13:00-14:30
Relations to attainment objectives of learning and education
Key words Indoor Air Quality, Healthy Building, Sick Building Syndrome, Ventilation Indoor Air Quality, Healthy Building, Sick Building Syndrome, Ventilation

(M45630120)Human Settlement: Its History and Theory[Human Settlement: Its History and Theory]

Subject name[English]	Human Settlement: Its History and Theory[Human Settlement: Its History and Theory]				
Schedule number	M45630120	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Thu.3~3	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	泉田 英雄 IZUMIDA Hideo				
Numbering					
Objectives of class					
<p>After understanding some basic knowledge on Classic and Japanese traditional architecture and city, the modern development of Japanese architecture and city is taught from various points of view; foreign influence and introduction of western technology, architectural education, neo-classic style, modern movement, Ginza Reconstruction and Parliament Building projects, building enactments, response to natural disasters, etc.</p> <p>After understanding some basic knowledge on Classic and Japanese traditional architecture and city, the modern development of Japanese architecture and city is taught from various points of view; foreign influence and introduction of western technology, architectural education, neo-classic style, modern movement, Ginza Reconstruction and Parliament Building projects, building enactments, response to natural disasters, etc.</p>					
Contents of class					
<p>1. Introduction Class Schedule, Ancient architecture in Asia</p> <p>2. Sacred Architecture Tomb, Shrine, India, Mesopotamia, Egypt</p> <p>3. Religious Architecture Temple in Buddhism, Church in Christianity, Mosque in Islam, Miew in Chinese belief</p> <p>4. Classic Architecture Greece, Roman, Classical=revival</p> <p>5. Early Dwellings in Japan Pit House and Raised Floor House</p> <p>6. Early City Planning and Nobles' Residence Grid-Patterned, Shinden Style</p> <p>7. Buddhist Architecture in Japan Horyuji temple, dice and beam bracket, roof tile, timber construction</p> <p>8. Shoin and Sukiya Styles Essential elements for Shingen stlye, Tea House</p> <p>9. Carpenters and tools Development of tools</p> <p>10. Early Modernization Movement and Foreign Settlements Dutch in Dejima, Fortification, Iron Manufacturing, Yokohama, Nagasaki</p> <p>11. Meiji Modernization Foundation of Kobu-sho, Public Works, Railway Construction, Foreign Engineers</p> <p>12. Imperial College of Engineering Organization, Teaching Staff, Building, Josiah Conder</p> <p>13. 1st Generation of Japanese Architects in late-19th century architecture Tatsuno, Sone, etc. Neo-Classic, Gothic Revival, Arts and Crafts</p> <p>14. 2nd Generation of Japanese Architect in early 20th century architecture Ito, Furukawa, Takeda, etc. Domestic Revival, Art Nouveau, Secession</p> <p>15. 3rd Generation of Japanese Architecture in Modernism Horiguchi, Yashi, Ishimoto, Maekawa, etc, F.L. Wright, Le Corbusier, Mies</p> <p>1. Introduction Class Schedule, Ancient architecture in Asia</p> <p>2. Sacred Architecture Tomb, Shrine, India, Mesopotamia, Egypt</p>					

3. Religious Architecture
Temple in Buddhism, Church in Christianity, Mosque in Islam, Miew in Chinese belief
4. Classic Architecture
Greece, Roman, Classical=revival
5. Early Dwellings in Japan
Pit House and Raised Floor House
6. Early City Planning and Nobles' Residence
Grid-Patterned, Shinden Style
7. Buddhist Architecture in Japan
Horyuji temple, dice and beam bracket, roof tile, timber construction
8. Shoin and Sukiya Styles
Essential elements for Shingen stlye, Tea House
9. Carpenters and tools
Development of tools
10. Early Modernization Movement and Foreign Settlements
Dutch in Dejima, Fortification, Iron Manufacturing, Yokohama, Nagasaki
11. Meiji Modernization
Foundation of Kobu-sho, Public Works, Railway Construction, Foreign Engineers
12. Imperial College of Engineering
Organization, Teaching Staff, Building, Josiah Conder
13. 1st Generation of Japanese Architects in late-19th century architecture
Tatsuno, Sone, etc. Neo-Classic, Gothic Revival, Arts and Crafts
14. 2nd Generation of Japanese Architect in early 20th century architecture
Ito, Furukawa, Takeda, etc. Domestic Revival, Art Nouveau, Secession
15. 3rd Generation of Japanese Architecture in Modernism
Horiguchi, Yashi, Ishimoto, Maekawa, etc, F.L. Wright, Le Corbusier, Mies

Self Preparation and Review

Related subjects

- 日本建築史(History of Japanese Architecture)
 世界建築史(History of World Architecture: Modern)
 建築修復保存論(Conservation and Restoration of Heritage Architecture)
 日本建築史(History of Japanese Architecture)
 世界建築史(History of World Architecture: Modern)
 建築修復保存論(Conservation and Restoration of Heritage Architecture)

Textbook1	Book title	Japanese Building Practice		ISBN	
	Author	Kenneth Frampton and Kunio Kudo	Publisher		Publish year

Notes for textbook

Notes for reference

Goals to be achieved

1. understanding of essentials for construction of dwellings/architecture
2. understanding of process of development of architecture styles
3. understanding of various styles of Japanese architecture
4. understanding of modernization process of Japanese architecture
1. understanding of essentials for construction of dwellings/architecture
2. understanding of process of development of architecture styles
3. understanding of various styles of Japanese architecture
4. understanding of modernization process of Japanese architecture

Evaluation of achievement

1. Participation to class discussion and short report (50%)
2. Final Report (50%)
1. Participation to class discussion and short report (50%)
2. Final Report (50%)

Examination

- レポートで実施
By Report

Details of examination
Other information
Reference URL https://sites.google.com/site/archisslh/home https://www.facebook.com/savelocalheritage https://sites.google.com/site/archisslh/home https://www.facebook.com/savelocalheritage
Office hours Wednesday 13:00~17:00 Wednesday 13:00~17:00
Relations to attainment objectives of learning and education
Key words architectural history, Japanese architecture architectural history, Japanese architecture

(M45630140)Advanced District Planning[Advanced District Planning]

Subject name[English]	Advanced District Planning[Advanced District Planning]				
Schedule number	M45630140	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Tue.1~1	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	浅野 純一郎 ASANO Junichiro				
Numbering					
Objectives of class					
<p>1) To gain the practical knowledge of urban and district planning. 2) To learn the advanced methods of district planning and design. 3) To learn the theory and the system of Japanese land use control system and land readjustment projects.</p> <p>1) To gain the practical knowledge of urban and district planning. 2) To learn the advanced methods of district planning and design. 3) To learn the theory and the system of Japanese land use control system and land readjustment projects.</p>					
Contents of class					
<p>The major topics that will be addressed in this class are the followings.</p> <ol style="list-style-type: none"> 1. Overview of the theory and concrete policy and methods about modern urban planning system in Japanese 2. Overview of Japanese land use control system, especially area division system and development permission. 3. Overview of Japanese land readjustment projects. 4. Practice by application of the design methods about land readjustment project and district planning. <p>Reporting textbook "Urban Planning System in Japan 2nd Edition" and doing workshop about land readjustment project and district planning.</p> <p>The major topics that will be addressed in this class are the followings.</p> <ol style="list-style-type: none"> 1. Overview of the theory and concrete policy and methods about modern urban planning system in Japanese 2. Overview of Japanese land use control system, especially area division system and development permission. 3. Overview of Japanese land readjustment projects. 4. Practice by application of the design methods about land readjustment project and district planning. <p>Reporting textbook "Urban Planning System in Japan 2nd Edition" and doing workshop about land readjustment project and district planning.</p>					
Self Preparation and Review					
Related subjects					
<p>The following knowledge is desirable,</p> <ol style="list-style-type: none"> 1) The basic knowledge on modern urban planning 2) The knowledge on urban planning system in your country <p>The following knowledge is desirable,</p> <ol style="list-style-type: none"> 1) The basic knowledge on modern urban planning 2) The knowledge on urban planning system in your country 					
Notes for textbook					
<ul style="list-style-type: none"> •Urban Planning System in Japan 2nd Edition •Urban Land Use Planning System in Japan 2dn Edition <p>Both have been published by Japan International Cooperation Agency</p> <ul style="list-style-type: none"> •Urban Planning System in Japan 2nd Edition •Urban Land Use Planning System in Japan 2dn Edition 					

Both have been published by Japan International Cooperation Agency

Notes for reference

Goals to be achieved

Evaluation of achievement

Submitting reports about textbook and another theme. Written report: 100%. but this report will be checked several classes through discussion with students.

Submitting reports about textbook and another theme. Written report: 100%. but this report will be checked several classes through discussion with students.

Examination

レポートで実施

By Report

Details of examination

Other information

Reference URL

<https://webct.edu.tut.ac.jp:443/webct/public/home.pl>

or <https://moodle.imc.tut.ac.jp/>

More information and pdf.files of textbook will be offered from Webct.

<https://webct.edu.tut.ac.jp:443/webct/public/home.pl>

or <https://moodle.imc.tut.ac.jp/>

More information and pdf.files of textbook will be offered from Webct.

Office hours

Relations to attainment objectives of learning and education

Key words

District planning, Land use control system, Land readjustment project

District planning, Land use control system, Land readjustment project

(M45630180)Advanced Computational Economics[Advanced Computational Economics]

Subject name[English]	Advanced Computational Economics[Advanced Computational Economics]				
Schedule number	M45630180	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Wed.4~4	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	渋澤 博幸 SHIBUSAWA Hiroyuki				
Numbering					
Objectives of class					
In this course, students learn the economic modeling techniques and the simulation methodology. In this course, students learn the economic modeling techniques and the simulation methodology.					
Contents of class					
1-2: Input-Output Model 3-4: Simple 2 Sectors General Equilibrium Model 5-6: Inter-Sectoral General Equilibrium Model 7-8: Simulation and Numerical Example 9-11: Open Model with Exports and Imports 12-13: General Equilibrium Model with Public Sector 14-15: Simulation and Numerical Example 1-2: Input-Output Model 3-4: Simple 2 Sectors General Equilibrium Model 5-6: Inter-Sectoral General Equilibrium Model 7-8: Simulation and Numerical Example 9-11: Open Model with Exports and Imports 12-13: General Equilibrium Model with Public Sector 14-15: Simulation and Numerical Example					
Self Preparation and Review					
Required Assignments Students are required to learn topics and exercises before and after each class. Required Assignments Students are required to learn topics and exercises before and after each class.					
Related subjects					
Industrial Policies, Econometrics Industrial Policies, Econometrics					
Notes for textbook					
Papers will be distributed. Papers will be distributed.					
Notes for reference					
Goals to be achieved					
Acquiring the theory of the general equilibrium model. Constructing a general equilibration model using an numerical data. Evaluating impacts of an economic polity using the general equilibrium model. Acquiring the theory of the general equilibrium model. Constructing a general equilibration model using an numerical data. Evaluating impacts of an economic polity using the general equilibrium model.					
Evaluation of achievement					
Reports must be submitted. Report 100%. A: 80 Points or higher, B: 65 points or higher, C:55 points or higher, D: Less than 55 points Reports must be submitted. Report 100%. A: 80 Points or higher, B: 65 points or higher, C:55 points or higher, D: Less than 55 points					

Examination

レポートで実施
By Report

Details of examination**Other information****Reference URL**

www.pm.ace.tut.ac.jp
www.pm.ace.tut.ac.jp

Office hours

Wednesday 9:00-10:00
Wednesday 9:00-10:00

Relations to attainment objectives of learning and education**Key words**

Computational Economics, Simulation
Computational Economics, Simulation

(M45630200)Advanced Structural System Planning and Design II[Advanced Structural System Planning and Design II]

Subject name[English]	Advanced Structural System Planning and Design II[Advanced Structural System Planning and Design II]				
Schedule number	M45630200	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu iin-S				
Numbering					
Objectives of class	It depends on the laboratory. The resistered students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.				
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
Examination	その他 By Report				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(M45630220)Advanced Environmental System Planning and Design II[Advanced Environmental System Planning and Design II]

Subject name[English]	Advanced Environmental System Planning and Design II[Advanced Environmental System Planning and Design II]				
Schedule number	M45630220	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu iin-S				
Numbering					
Objectives of class	It depends on the laboratory. The resistered students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.				
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
Examination	その他 By Report				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(M45630240)Advanced Regional System Planning and Design II[Advanced Regional System Planning and Design II]

Subject name[English]	Advanced Regional System Planning and Design II[Advanced Regional System Planning and Design II]				
Schedule number	M45630240	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu iin-S				
Numbering					
Objectives of class	It depends on the laboratory. The resistered students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.				
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
Examination	その他 By Report				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(M45630310)Water Environment Engineering I[Water Environment Engineering I]

Subject name[English]	Water Environment Engineering I[Water Environment Engineering I]				
Schedule number	M45630310	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Tue.5~5	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Begging grade	M1, M2
Charge teacher name[Roman alphabet mark]	横田 久里子 YOKOTA Kuriko				
Numbering					
Objectives of class					
To know and understand the water pollutants in water environment. To know and understand Environmental Quality Standards for Water Pollutants in Japan. To know and understand the water pollutants in water environment. To know and understand Environmental Quality Standards for Water Pollutants in Japan.					
Contents of class					
History of Water Pollution in Japan 1) Minamata disease 2) Chronic cadmium poisoning Environmental Quality Standards for Water Pollutants 1)Environmental Quality Standards for Human Health and Monitored Substances and Guideline Values 2)Environmental Quality Standards for Conservation of the Living Environment					
Water pollutants in water environment 1)Nutrients 2)Chemicals in water environment History of Water Pollution in Japan 1) Minamata disease 2) Chronic cadmium poisoning Environmental Quality Standards for Water Pollutants 1)Environmental Quality Standards for Human Health and Monitored Substances and Guideline Values 2)Environmental Quality Standards for Conservation of the Living Environment					
Water pollutants in water environment 1)Nutrients 2)Chemicals in water environment					
Self Preparation and Review					
Related subjects					
Notes for textbook					
No textbook is required for this class. No textbook is required for this class.					
Notes for reference					
Goals to be achieved					
To understand the water pollution and environmental quality standard. To understand the water pollution and environmental quality standard.					
Evaluation of achievement					
Reports Reports					
Examination					
レポートで実施 By Report					
Details of examination					

Other information

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Reference URL**Office hours**

Wednesday 12:00- 13:00

Wednesday 12:00- 13:00

Relations to attainment objectives of learning and education**Key words**