Syllabus

International Master′s Degree Program

（2018-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	Mechanical Engineering, Architecture and Civil Engineering, Electrical and Electronic Information Engineering, Computer Science and Engineering, Environmental and Life Sciences			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	藤原 孝男 FUJIWARA Takao				
Numbering	GEN_LIB52325				

Objectives of class

Study objective is to learn an analytical capability on social and managerial perspectives.
This class introduces basic finance knowledge to understand the managerial idea and the 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 on the valuation of financial option as a derivative based on the elementary probabiity, interest rate, and arbitrage theory.
Class content will include following topics:
#1: baic probability,
#2: normal random 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: group exercises about business plan,
#15: group exercises about business presentation,
#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 Management.

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

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 as a financial derivative.

Evaluation of achievement

Evaluation Style:
Evaluation weight allocation is planned as Semester Examination 60%, Reports 20%, and Presentation 20%.

Evaluation Criteria:
Bachelor 3rd year, Master 1st year
S: If students achieved every above goals and their summed scores are equal or more than 90 (the maxim scores 100).
A: If students achieved 80% of above goals and their summed scores are equal or more than 80 (the maxim scores 100).
B: If students achieved at least 70% of above goals and their summed scores are equal or more than 70 (the maxim scores 100).
C: If students achieved at least 60% of above goals and their summed scores are equal or more than 60 (the maxim scores 100).

The others
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

定期試験を実施(対面)
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

(A)幅広い人間性と考え方
人間社会を地球的な視点から多面的にとらえ，自然と人間との共生，人類の幸福・健康・福祉について考える能力
(B)技術者としての正しい倫理観と社会性
技術者としての専門的・倫理的責任を自覚し，社会における技術的課題を設定・解決・評価する能力
(A)幅広い人間性と考え方
人間社会を地球的な視点から多面的にとらえ，自然と人間との共生，人類の幸福・健康・福祉について考える能力
(B)技術者としての正しい倫理観と社会性
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(A)幅広い人間性と考え方
人間社会を地球的な視点から多面的にとらえ，自然と人間との共生，人類の幸福・健康・福祉について考える能力
(B)技術者としての正しい倫理観と社会性
技術者としての専門的・倫理的責任を自覚し，社会における技術的課題を設定・解決・評価する能力
(A)豊かな人間性と幅広い考え方
自然と人間との共生を目的とし、地球的な視点から多面的に物事を考える能力
(B)技術者としての正しい倫理観と社会性
実践的・創造的・指導的な技術者としての社会的・倫理的責任を自覚し，技術的課題を解決する能力

Key words
Real Options, Game Theory, Operations Management, Management

(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	Mechanical Engineering, Architecture and Civil Engineering, Electrical and Electronic Information Engineering, Computer Science and Engineering, Environmental and Life Sciences			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	S総合ー教務委員, Lim Pang Boey, 大門 裕之, 穂積 直裕, 井佐原 均, 福本 昌宏, 岩佐 精二, 齊藤 大樹, 髙嶋 孝明, 伊藤 公毅, 和泉 司, 武藤 浩行, 藤原 孝男, 毛利 雅子, 加藤 三保子, 中村 大介 Sougou kyoiku kyomu Iin, Lim Pang Boey, DAIMON Hiroyuki, HOZUMI Naohiro, ISAHARA Hitoshi, FUKUMOTO Masahiro, IWASA Seiji, SAITOH Taiki, TAKASHIMA Takaaki, ITO Koki, IZUMI Tsukasa, MUTO Hiroyuki, FUJIWARA Takao, MOURI Masako, KATOH Mihoko, NAKAMURA Daisuke				
Numbering	GEN_LIB51325				

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

1. Lim Pang Boey "Japanese Education System"
Learn about the Japanese education system and what the life of a student is like in Japan?

2. Daimon "Working in Japanese Company"
Learn and discuss about working in Japanese company and what you should do for it.

3. Hozumi "Japan's Modernization Suppoted 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.

4. 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.

5.Fukumoto "Introduction of advanced surface modofication and welding technology in Japan"
Two advanced materials processing will be introduced. One is on the surface modification technology based on the particles 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.

6. 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 an Basic Technology in all of Science—
◆New Horizon of Catalytic Asymmetric Synthesis —C1 Asymmetric Catalyst—

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.

8.Takashima "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.

9. 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.)

10. Nakamura "Cinema of Japan"
Japan is recognized as one of the most creative countries in the movie culture. Regarding films such as Naruse, Ozu,Godzilla and "Chanbara", students will learn some aspects of Japanese movie culture.

11. 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.

12. 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.

13. Mouri "Legal interpreting in Japan"
Japan has faced the numbers of foreign national criminals along with the globalization. This class explains the criminal justice, in particular focusing on foreign national criminals and legal interpreting in Japan.

14. 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.

15.Izumi "Modern literature in Japanese society"
Although book sales is decreasing in Japan recently, there are a lot of people who want to become a novelist. Why don't Japanese people buy books? Nevertheless, why do some people want to become a Novelist?
Let's think about book market in Japan together and learn about Japanese modern literature.

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 at least 65 % of goals and obtained total points of exam and reports, 65 or higher (out of 100 points).
C: Achieved at least 55 % of goals and obtained 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

Reference URL

Office hours

After each class.

Relations to attainment objectives of learning and education

機械工学専攻
(A)幅広い人間性と考え方
人間社会を地球的な視点から多面的にとらえ，自然と人間との共生，人類の幸福・健康・福祉について考える能力
電気・電子情報工学専攻
(A)幅広い人間性と考え方
人間社会を地球的な視点から多面的にとらえ，自然と人間との共生，人類の幸福・健康・福祉について考える能力
情報・知能工学専攻
(A)幅広い人間性と考え方
人間社会を地球的な視点から多面的にとらえ，自然と人間との共生，人類の幸福・健康・福祉について考える能力
環境・生命工学専攻
(A)幅広い人間性と考え方
人間社会を地球的な視点から多面的にとらえ，自然と人間との共生，人類の幸福・健康・福祉について考える能力
建築・都市システム学専攻
(A)豊かな人間性と幅広い考え方
自然と人間との共生を目的とし、地球的な視点から多面的に物事を考える能力

Key words

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

(M40030080)Principles of Japanese Conversation[Principles of Japanese Conversation]

Subject name[English]	Principles of Japanese Conversation[Principles of Japanese Conversation]				
Schedule number	M40030080	**Subject area**	General courses	**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	Mechanical Engineering, Architecture and Civil Engineering, Electrical and Electronic Information Engineering, Computer Science and Engineering, Environmental and Life Sciences			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	村松　由起子 MURAMATSU Yukiko				
Numbering	GEN_LIB54025				

Objectives of class

This is a Basic Japanese conversation class. You will learn elementary Japanese grammar and vocabulary to speak Japanese on campus.

Contents of class

Students will learn the following lessons in Japanese textbook " Basic Japanese for Students Hakase1".

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.

Related subjects

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, Doi mitsuru	**Publisher**	3A Corporation（スリーエーネットワーク）	**Publish year**	

Notes for textbook

Notes for reference

Goals to be achieved

1)You will be able to understand basic Japanese structures and grammatical items.
2)You will be able to communicate with Japanese people in easy Japanese.

Evaluation of achievement

Evaluation Weight
Homework 40%
The term examination 60%
Grade
A:Total score is 80 or higher
B:Total score is 65 or higher
C:Total score is 55 or higher

Examination
その他
Other

Details of examination

Other information

Reference URL

Office hours
Tuesday 13:00-13:30

Relations to attainment objectives of learning and education

電気・電子情報工学専攻
(A)幅広い人間性と考え方
人間社会を地球的な視点から多面的にとらえ，自然と人間との共生，人類の幸福・健康・福祉について考える能力

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
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS51015				

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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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**	M1
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS61015				

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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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**	1～2
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	MEC_MAS61015				

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

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	MEC_MAS61015				

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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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～
Department Offered	Mechanical Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	S1系教務委員, 1系各教員 1kei kyomu Iin-S, 1kei kakukyouin				
Numbering	MEC_MAS61015				

Objectives of class

The thesis research aims to 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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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**	M1
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS61015				

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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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
Charge teacher name[Roman alphabet mark]	福本　昌宏 FUKUMOTO Masahiro				
Numbering	MEC_MAS54025				

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

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

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.

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Notes for textbook

Handouts will be prepared for participants.
(Reference)
Required readings will be taken from a variety of reference books and research papers.

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(Reference)
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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 maretials, Surface modification, Thermal spraying, Cold spraying, FSW
Joining in dissimilar maretials, Surface modification, Thermal spraying, Cold spraying, FSW

(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
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS53025				

Objectives of class

This lecture aims to provide a broad understanding of the mechanical systems design 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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS54025				

Objectives of class

This lecture aims to provide a 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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS55025				

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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS56025				

Objectives of class

This lecture aims to provide a 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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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
Charge teacher name[Roman alphabet mark]	河村　庄造 KAWAMURA Shozo				
Numbering	MEC_MAS53025				

Objectives of class

学部の振動工学・応用振動工学で 1 自由度系, 2 自由度系の振動解析について学んでいるが, 実際の機械・構造物は非常に大規模自由度を有している. そのため, はじめに一般的な多自由度系を扱うモード解析について講義を行う. 次に, 大規模自由度の振動解析を簡便に行うことのできる部分構造合成法について講義し, それらの基本的な考え方を理解する.

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

多自由度系のモード解析
1:モード解析の導入, 不減衰系
2:比例粘性減衰系(1)
3:比例粘性減衰系(2)
4:高次モードの影響

部分構造合成法
5:分系の定式化
6:拘束モード型モード合成法(1)
7:拘束モード型モード合成法(2)
8:不拘束モード型モード合成法

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

毎回の講義内容を復習するとともに, 次週の内容について参考資料等を参考に予習してくること.
Self-preparation and review are necessary.

Related subjects

数学, 機械力学, 振動工学, 応用振動工学
Dynamics, Vibration engineering, Mechanical vibration

Notes for textbook

参考資料に基づいて講義を行う. 資料は配布あるいは受講者が Web サイトからダウンロードする.
Handouts will be prepared.

Reference1	**Book title**	モード解析			**ISBN**	
	Author	長松昭男	**Publisher**	培風館	**Publish year**	
Reference2	**Book title**	部分構造合成法			**ISBN**	
	Author	長松昭男・大熊政明	**Publisher**	培風館	**Publish year**	
Reference3	**Book title**	振動工学ー応用編ー			**ISBN**	

	Author	安田仁彦	Publisher	コロナ社	Publish year	

Notes for reference

Goals to be achieved

(1) 多自由度系のモード解析について基礎的な理解を得ること
(2) 部分構造合成法について基礎的な理解を得ること

(1) Understand the modal analysis for multi degree of freedom system
(2) Understand the component mode synthesis method

Evaluation of achievement

評価法　:達成目標の到達度を 2 回のレポート(100 点満点)で評価する.
評価基準:評価法による得点が 55 点以上の場合を合格(達成目標に到達した)とする.
　　なお得点によって達成の程度を明示する. 評価 A:80 点以上, 評価 B:65 点以上, 評価 C:55 点以上

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

河村庄造:部屋番号 D-404, E-Mail:kawamura@me.tut.ac.jp
Contact person: Prof. Shozo Kawamura E-Mail:kawamura@me.tut.ac.jp

Reference URL

Office hours

E メール等で随時時間を打ち合わせる
Ask by E-mail.

Relations to attainment objectives of learning and education

Key words

モード合成法, 部分構造合成法
Modal analysis, Component mode synthesis method

(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**	M2
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
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

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**	1～1
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	ELC_MAS51025				

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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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**	2～2
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	ELC_MAS51015				

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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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～
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
Numbering	ELC_MAS51015				

Objectives of class

The seminar aims to provide a broad understanding of theoretical and experimental approoches 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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
Numbering	ELC_MAS51015				

Objectives of class

The seminar aims to provide a 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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Seminar on Electrical and Electronic Information Engineering 1B[Seminar on Electrical and Electronic Information Engineering 1B]				
Schedule number	M42610060	**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)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
Numbering	ELC_MAS51015				

Objectives of class

The seminar aims to provide a broad understanding of theoretical and experimental approoches 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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
Numbering	ELC_MAS58025				

Objectives of class

The class aims to provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis.

Contents of class

The class 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

To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes.

Notes for reference

Goals to be achieved

To acquire the ability of identifying and formulating research problem, planning and implementing specific research tasks, troubleshooting and communicating outcomes.

Evaluation of achievement

Coursework and presentation are evaluated generally.

Examination

試験期間中には何も行わない

None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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.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
Charge teacher name[Roman alphabet mark]	松田　厚範, 服部　敏明, 石山　武 MATSUDA Atsunori, HATTORI Toshiaki, ISHIYAMA Takeshi				
Numbering	ELC_MAS53025				

Objectives of class

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

Contents of class

"Physics for Electronics 2" is composed of four topics of functional materials, photonics, electrodics, 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 ionis including Li-ion battery and fuel cell, and 5) Functional materials for optics including coatings, micro-optical components, and photonic devices.

The category of "electrodics" 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.

Related subjects

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

Notes for textbook

(1) Atkins' Physical Chemistry,
by Peter Atkins (Author),　Julio de Paula (Author)
(Oxford University Press) (2014)ISBN-10: 019969740X

(2) Inorganic Chemistry Paperback,
by Duward Shriver (Author)
(W. H. Freeman)(2014) ISBN-10: 1429299061

Notes for reference

Goals to be achieved

(1) To understand fundamental aspects on functional materials, photonics, electrodics 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, electrodics, 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.

Other information

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

Office hours

one hour after every classes

Relations to attainment objectives of learning and education

Key words

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

(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**	Tue.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
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	ELC_MAS53025				

Objectives of class

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.

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.

Contents of class

Sub Course 1(Y. Suda)
1. Fundamental concept of electrical energy engineering
2. Three-phase systems
3. Power electronics

Sub Course 2(R. Inada)
1. Introduction of Electrochemical Energy Conversion Devices
2. Lithium-Ion Secondary Batteries
3. Recent Trend in Electrochemical Energy Conversion Devices

Sub Course 3(Yo. Murakami)
1. Introduction of Electric Energy Systems
2. High Voltage Engineering and Electrical Insulation
3. Fundamental Properties of Dielectrics and Electrical Insulating Materials.

Sub Course 1(Y. Suda)
1. Fundamental concept of electrical energy engineering
2. Three-phase systems
3. Power electronics

Sub Course 2(R. Inada)
1. Introduction of Electrochemical Energy Conversion Devices
2. Lithium-Ion Secondary Batteries
3. Recent Trend in Electrochemical Energy Conversion Devices

Sub Course 3(Yo. Murakami)
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

Basic electrical power engineering course is prerequisite.

Basic electrical power engineering course is prerequisite.

Notes for textbook

Materials will be prepared by the lecturer.

Materials will be prepared by the lecturer.

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**	Thu.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
Charge teacher name[Roman alphabet mark]	澤田　和明, 石川　靖彦, 関口　寛人, 髙橋　一浩 SAWADA Kazuaki, ISHIKAWA Yasuhiko, SEKIGUCHI Hiroto, TAKAHASHI Kazuhiro				
Numbering	ELC_MAS54025				

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
Y. Ishikawa (C-607)
ishikawa@ee.tut.ac.jp
H. Sekiguchi (C-610)
sekiguchi@ee.tut.ac.jp
ext. 6744
K. Takahashi (C-606)
takahashi@ee.tut.ac.jp
ext. 6740
K.Sawada (C-605)
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Y. Ishikawa (C-607)
ishikawa@ee.tut.ac.jp
H. Sekiguchi (C-610)
sekiguchi@ee.tut.ac.jp
ext. 6744
K. Takahashi (C-606)
takahashi@ee.tut.ac.jp
ext. 6740

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
Charge teacher name[Roman alphabet mark]	大平 孝, 上原 秀幸, 竹内 啓悟 OHIRA Takashi, UEHARA Hideyuki, TAKEUCHI Keigo				
Numbering	ELC_MAS55025				

Objectives of class

Students select one course from the following three courses:
A 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.
A 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.
The last course is intended for learning point-to-point communication systems, multiuser communication systems, and multiple-input multiple-output (MIMO) systems in the physical layer of wireless communications. Students challenge a unified understanding of existing advanced schemes in wireless communications.

Contents of class

Course 1 provided by Prof. Ohira:
1. Transmission lines
2. Scattering matrix
3. Mizuhashi Smith chart

Course 2 provided by Prof. Uehara:
1. Medium access control protocols
2. Multi-hop communications
3. Ad hoc and sensor networks

Course 3 provided by Prof. Takeuchi:
1. Point-to-point communication systems
2. Multiuser communication systems
3. MIMO systems

Self Preparation and Review

Related subjects

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.

Course 3:
Basic understanding on modulation/demodulation, signal processing, probability theory, and information theory are prerequisite.

Notes for textbook

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

Course 2: Instruct in 1st class.

Course 3: Same as Course 2.

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 3:
- Understand the concept of detection, diversity, and channel uncertainty in point-to-point communication systems.
- Understand resource allocation and interference management in multiuser communication systems.
- Understand statistical channel models and basic multiuser detection schemes in MIMO systems.

Evaluation of achievement

Course 1: Marks are based on the final test.

Course 2: Marks are based on reports and presentations.

Course 3: Marks are based on reports and tests.

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/

Reference URL

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

Office hours

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, wireless communications, modulation/demodulation, MIMO

(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
Charge teacher name[Roman alphabet mark]	S3系教務委員－2, S3系教務委員 3kei kyomu Iin-S2, 3kei kyomu Iin-S				
Numbering	CMP_MAS71015				

Objectives of class

各研究室が指定する情報学に関する最先端の技術情報(特に英語による最先端の技術情報)を発見する能力、ならびに、その技術情報を理解、説明、質疑・応答できる能力を養う。

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

教員が指定する最先端の技術情報(特に英語による最先端の技術情報)について理解したところを説明する。

教員は技術情報の内容の発見、理解、説明、質疑・応答する方法について直接指導を行う。

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

教員が指定する内容に関し、予習・復習を行う。

Consult with your advisor.

Related subjects

指導教員に問い合わせること。

Consult with your advisor.

Notes for textbook

指導教員に問い合わせること。

Consult with your advisor.

Notes for reference

Goals to be achieved

(1)最先端の専門分野の英文が理解でき、わかりやすく説明できる。

(2)技術的な情報を扱う英文が解釈でき、作文できる。

(3)論文の標準的な構成ができる。

(4)発表というスタイルでの情報提供ができる。

(5)情報の不足を質問という形式で指摘できる。

(1) To understand English literature on state-of-the-art areas of expertise, and to explain clearly.

(2) To interpret technical information written in English, and to write such information in English.

(3) To make a standard construction of a technical paper.

(4) To provide information by oral presentation.

(5) To point out the lack of information by questions.

Evaluation of achievement

技術情報の発見に向けた自主性、技術情報の理解度、説明の方法、質問への回答、議論への参加の様子等から総合的に指導教員が判定する。

Will be evaluated by taking into accout various factors overall, such as technical explanation, question answering, discussion involvements and so on.

Examination

試験期間中には何も行わない
None during exam period

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

Other information

Reference URL

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

Relations to attainment objectives of learning and education

Key words

(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**	M1
Charge teacher name[Roman alphabet mark]	S3系教務委員, S3系教務委員－23kei kyomu Iin-S, 3kei kyomu Iin-S2				
Numbering	CMP_MAS71015				

Objectives of class

各研究室が指定する情報学に関する最先端の技術情報(特に英語による最先端の技術情報)を発見する能力、ならびに、その技術情報を理解、説明、質疑・応答できる能力を養う。

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

教員が指定する最先端の技術情報(特に英語による最先端の技術情報)について理解したところを説明する。

教員は技術情報の内容の発見、理解、説明、質疑・応答する方法について直接指導を行う。

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

教員が指定する内容に関し、予習・復習を行う。

Consult with your advisor.

Related subjects

指導教員に問い合わせること。

Consult with your advisor.

Notes for textbook

授業にて指定する。

Consult with your advisor.

Notes for reference

Goals to be achieved

(1)最先端の専門分野の英文が理解でき、わかりやすく説明できる。
(2)技術的な情報を扱う英文が解釈でき、作文できる。
(3)論文の標準的な構成ができる。
(4)発表というスタイルでの情報提供ができる。
(5)情報の不足を質問という形式で指摘できる。

(1) To understand English literature on state-of-the-art areas of expertise, and to explain clearly.
(2) To interpret technical information written in English, and to write such information in English.
(3) To make a standard construction of a technical paper.
(4) To provide information by oral presentation.
(5) To point out the lack of information by questions.

Evaluation of achievement

技術情報の発見に向けた自主性、技術情報の理解度、説明の方法、質問への回答、議論への参加の様子等から総合的に指導教員が判定する。

Will be evaluated by taking into accout various factors overall, such as technical explanation, question answering, discussion involvements and so on.

Examination 試験期間中には何も行わない None during exam period
Details of examination 試験期間中には何も行わない Non during exam period
Other information 指導教員に問い合わせること。 Consult with your advisor.
Reference URL
Office hours 指導教員に問い合わせること。 Consult with your advisor.
Relations to attainment objectives of learning and education
Key words

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

Subject name[English]	Thesis Research on Computer Science and Engineering[Thesis Research on Computer 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**	M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, S3系教務委員－23kei kyomu Iin-S, 3kei kyomu Iin-S2				
Numbering					

Objectives of class

The course is intended for students to foster their interests in research problems on computer science and engineering and to acquire ability for independent studies.
It is also aimed for students to acquire, through thesis research, cooperativeness, a sense of responsibility, abilities for problem solving, research planning, decision making, outcome presentation and subject investigation, and to enhance their creativity and persistency, among others.

Contents of class

It is usually the case that thesis research is carried out on individual bases with specific contents differing from one student to another.
Consult with your advisor for any further details.

Self Preparation and Review

Consult with your advisor for them.

Related subjects

Consult with your advisor for them.

Notes for textbook

Consult with your advisor for them.

Notes for reference

Goals to be achieved

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

Evaluation of achievement

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

Examination

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**	1～1
Department Offered	Computer Science and Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	S3系教務委員，3系各教員，S3系教務委員－23kei kyomu Iin-S, 3kei kakukyouin, 3kei kyomu Iin-S2				
Numbering	CMP_MAS61015				

Objectives of class

The course is intended for students to foster their interests in research problems on computer science and engineering and to acquire ability for independent studies.
It is also aimed for students to acquire, through thesis research, cooperativeness, a sense of responsibility, abilities for problem solving, research planning, decision making, outcome presentation and subject investigation, and to enhance their creativity and persistency, among others.

Contents of class

It is usually the case that thesis research is carried out on individual bases with specific contents differing from one student to another.
Consult with your advisor for any further details.

Self Preparation and Review

Consult with your advisor for them.

Related subjects

Consult with your advisor for them.

Notes for textbook

Consult with your advisor for them.

Notes for reference

Goals to be achieved

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

Evaluation of achievement

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

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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，S3系教務委員－23kei kyomu Iin-S, 3kei kakukyouin, 3kei kyomu Iin-S2				
Numbering	CMP_MAS61015				

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

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 accout various factors overall, such as technical explanation, question answering, discussion involvements and so on.

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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**	M1
Charge teacher name[Roman alphabet mark]	S3系教務委員, S3系教務委員－23kei kyomu Iin-S, 3kei kyomu Iin-S2				
Numbering	CMP_MAS61015				

Objectives of class

各研究室が指定する情報学に関する最先端の技術情報(特に英語による最先端の技術情報)を発見する能力、ならびに、その技術情報を理解、説明、質疑・応答できる能力を養う。

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

教員が指定する最先端の技術情報(特に英語による最先端の技術情報)について理解したところを説明する。

教員は技術情報の内容の発見、理解、説明、質疑・応答する方法について直接指導を行う。

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

教員が指定する内容に関し、予習・復習を行う。

Consult with your advisor.

Related subjects

指導教員に問い合わせること。

Consult with your advisor.

Notes for textbook

指導教員に問い合わせること。

Consult with your advisor.

Notes for reference

Goals to be achieved

(1)最先端の専門分野の英文が理解でき、わかりやすく説明できる。

(2)技術的な情報を扱う英文が解釈でき、作文できる。

(3)論文の標準的な構成ができる。

(4)発表というスタイルでの情報提供ができる。

(5)情報の不足を質問という形式で指摘できる。

(1) To understand English literature on state-of-the-art areas of expertise, and to explain clearly.

(2) To interpret technical information written in English, and to write such information in English.

(3) To make a standard construction of a technical paper.

(4) To provide information by oral presentation.

(5) To point out the lack of information by questions.

Evaluation of achievement

技術情報の発見に向けた自主性、技術情報の理解度、説明の方法、質問への回答、議論への参加の様子等から総合的に指導教員が判定する。

Will be evaluated by taking into accout various factors overall, such as technical explanation, question answering, discussion involvements and so on.

Examination

試験期間中には何も行わない None during exam period
Details of examination 課題レポートやプレゼンテーションに基づいて評価する。 Your supervisor will evaluate your presentation and your reports.
Other information
Reference URL
Office hours
Relations to attainment objectives of learning and education
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
Charge teacher name[Roman alphabet mark]	河合 和久 KAWAI Kazuhisa				
Numbering	CMP_MAS52225				

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 SAN-HAN) *** in JAPANESE ***			**ISBN**	978-4-274-21920-7
	Author	Yasushi Kuno, et al.	**Publisher**	OHM-SHA	**Publish year**	2016

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
Charge teacher name[Roman alphabet mark]	後藤 仁志 GOTO Hitoshi				
Numbering	CMP_MAS53025				

Objectives of class

The objective of this class is to understand chemical, molecular biological and biophysical phenomena that can be solved by molecular simulation technologies.
In achieving this objective, students will be required to attempt to acquire the elementary concepts in molecular mechanics (MM) method, molecular dynamics (MD) method, molecular orbital (MO) method, and will learn about thermodynamic and electronic properties of small molecules (drug candidate compunds and organic materials) and biopolymers (proteins, RNA and DNA).

Contents of class

Considering the preliminary knowledge of the participates in this class, some topics from the following things will be chosen to be learned.
(1) Outline of molecular simulation (1st week)
(2) Molecular mechanics (MM) method and local/grobal minimum search method (2nd and 3rd weeks)
(3) Molecular dynamics (MD) method and motion equation (4th and 5th weeks)
(4) Basis of quantum chemistry and molecular orbital (MO) method (6th, 7th and 8th weeks)
(5) Stereochemistry, statistical thermodynamics and measurement techniques (9th week)
(6) Analyses of chemical reaction and crystal structure of organic molecules (10 and 11th weeks)
(7) Biopolymer simulations and bioinformatics (12th and 13rd weeks)
(8) Chemoinformatics (machine learning) and molecular design theory (14th and 15th weeks)

Self Preparation and Review

Related subjects

Notes for textbook

documents distributed

Reference1	**Book title**	Introduction to Computational Chemistry, 3nd Ed.			**ISBN**	978-1118825990
	Author	Frank Jensen	**Publisher**	Wiley	**Publish year**	2016

Notes for reference

Goals to be achieved

The objective of this class is to understand chemical, molecular biological and biophysical phenomena that can be solved by molecular simulation technologies.

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 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

Contact: F-307, {gotoh}@tut.jp

Reference URL

under construction

Office hours

Please check the schedule by E-mail in advance.

Relations to attainment objectives of learning and education

Key words

Molecular Mechanics, Molecular Dynamics, Quantum Chemistry, Quantum Mechanics, Chemoinformatics

(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**	Mon.1～1	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Computer Science and Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	青野 雅樹 AONO Masaki				
Numbering	CMP_MAS52425				

Objectives of class

インターネット、すなわち Web 上には、大量のデータが日々作成・蓄積・更新されている。この中から有用なデータを検索し、抽出する Web アプリケーション技術や、複数の Web アプリケーション間でデータをやりとりする技術も重要になってきている。特に、このようなビッグデータをどう表現するかも、アプリケーションをカスケードする場合、必須である。
本講義では、Web 上やデータファイルにあるテキストだけでなく、画像、動画、3D モデルなど様々なメディアに対するデータ表現技術、特徴量抽出技術、次元削減を含むインデクシング、テキストマイニング、データマイニング、自然言語処理、情報検索技術、回帰・分類・クラスタリングに代表される統計的機械学習、リンク解析に代表される Web マイニング技術、ならびに深層学習技術に焦点を当て、最新のデータサイエンス技術を講述する。

Day by day, a massive amount of data has been generated, accumulated, and updated on the Internet, where data include texts, images, sounds, movies, 2D/3D shapes, numeric values, and their composites. Extracting important pieces of information is crucial in many Closed/Open Web applications. The objectives of this lecture is to demonstrate the state-of-the art technologies in data science ranging from data representation, data mining, text mining, natural language processing, information retrieval, information extraction, machine learning (including both unsupervised and supervised learning with/without deep learning frameworks), based on fundamental data science technologies.

Contents of class

(1)はじめに(データ表現を含むデータ科学の基礎)
(2)統計と基礎機械学習技術
(3)情報検索(検索、類似性、言語モデル、次元削減、評価)
(4)Web リンク解析とコンテンツマイニングを含む Web マイニング
(5)教師なし学習(クラスタリング)、評価
(6)教師あり学習(回帰、分類)、評価
(7)マルチメディアの特徴抽出、検索、分類、ディープラーニング入門
(8)最終試験
(1) Introduction (Basics of Data Science including Data Representation)
(2) Statistics and Basic Machine Learning Technologies
(3) Information Retrieval (Search, Similarity, Language Model, Dimensional Reduction, Evaluations)
(4) Web Mining including Web Link Analysis and Content Mining
(5) Unsupervised Learning (Clustering), Evaluations
(6) Supervised Learning (Regression, Classification), Evaluations
(7) Multimedia Feature Extraction, Search, Classification, and Introduction to Deep Learning
(8) Final Exam

Self Preparation and Review

基本的なデータマイニング技術(主成分分析・判別分析・回帰分析、クラスタリング)に関しては、各自、予習・復習をしておくこと。特に、授業の補助用 Web ページで、Python (Jupyter notebook) を使った自習教材を準備するので、慣れておくことが好ましい。
It is desirable to self-study as well as to review fundamental data mining techniques such as clustering, classification, and regression. It should be noted that the knowledge on machine learning and multivariate analysis techniques such as principal component analysis is a prerequisite to this class. It is recommended installing Python into your computer, because some of the lecture materials are assumed the knowledge of Python.

Related subjects

Notes for textbook

授業の資料は、http://www.kde.cs.tut.ac.jp/~aono/myLecture.html で公開する。
Materials for this class will be availlable at http://www.kde.cs.tut.ac.jp/~aono/myLecture.html.

Reference1	**Book title**	Information Retrieval, Implementing and Evaluating Search Engines			**ISBN**	978-0-262-02651-2
	Author	Stefan Buttcher, Charles L.A. Clarke, Gordon V. Cormack	**Publisher**	MIT Press	**Publish year**	2010
Reference2	**Book title**	Data Mining and Analysis			**ISBN**	978-0-521-76633-3
	Author	Mohammed J. Zaki, Wagner Meira Jr.	**Publisher**	Cambridge University Press	**Publish year**	2014
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
Reference4	**Book title**	Python Machine Learning			**ISBN**	978-1-78355-513-0
	Author	Sebastian Raschka	**Publisher**	PACKT Publishing	**Publish year**	2016

Notes for reference

参考書 5
書名「Modern Information Retrieval, the concepts and technology behind search, Second Edition」
著者名：Ricardo Baeza-Yates, Bertier Ribeiro-Neto
出版社：Addison Wesley
ISBN：978-0-321-41691-9
出版年：2011

参考書 6
書名「Google's PageRank and Beyond」
著者名：Amy N. Langville, Carl D. Meyer
出版社：Princeton University Press
ISBN：978-0-691-12202-1
出版年：2006

Reference #5
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 #6
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

（1）データサイエンス・データマイニング（データ表現、主成分分析に代表される多変量解析）の基礎技術が理解できること
（2）情報検索（自然言語処理、文書検索・メディア検索、類似度、ランキング）の基礎技術が理解できること
（3）機械学習（分類、回帰分析、クラスタリング）ならびに深層学習の基礎技術が理解できること
（4）リンク解析、Web マイニング解析、時系列データ解析等の基礎技術が理解できること

The following items have to be achieved:
1. Able to implement and apply fundamental data science (mining) technologies.
2. Able to understand fundamental technologies of information retrieval such as natural language processing, search performance measures, feature extraction, and ranking methods such as language model
3. Able to understand basics of machine learning (classification, regression, clustering) and deep learning

4. Able to understand basics of Web link analysis, Wen content mining, Time series data mining

Evaluation of achievement

原則として、すべての授業に出席したものにつき、下記のように成績を評価する。

定期試験 80 点、課題 20 点の合計で評価する。

A: 80 点以上, B: 65 点以上, C: 55 点以上

In principle, for those who have attended all the classes, the credit will be given as follows:

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

C-511、TEL: 6764, Email: 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

事前に aono@tut.jp まで電子メールで予約をとること。

It is recommended that prior email appointment is preferable.

Relations to attainment objectives of learning and education

Key words

データ・テキストマイニング、情報検索、特徴量抽出、機械学習、深層学習

data and text mining, information retrieval, feature extraction, machine learning, deep learning

(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
Charge teacher name[Roman alphabet mark]	福村　直博 FUKUMURA Naohiro				
Numbering	CMP_MAS53025				

Objectives of class

巧みな運動を実現する生体の情報処理メカニズムの理解のための計算論的なアプローチの手法を理解する。

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．運動情報処理システムのイントロダクション
　運動制御への計算論的アプローチ
2．運動制御の処理システム、筋肉、運動神経
3−4．ヒト腕運動の学習制御モデル
5−6．ヒト腕運動の運動計画モデル
7．ヒトの把持運動モデル
8．定期試験

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

講義資料を事前に Dream Campus にて公開するので、講義当日までにダウンロードしておくこと。

Lecture material is disclosed to Dream Campus system beforehand.

Related subjects

視覚認知科学特論（博士前期）、システム・知能科学特論（博士前期）

Visual Perception and Cognition, Advanced System and Knowledge Scieces

Notes for textbook

講義資料を事前に Dream Campus にて公開するので、講義当日までにダウンロードしておくこと。

Lecture material is disclosed to Dream Campus system beforehand, so you should download it.

Reference1	**Book title**	Human motor control			**ISBN**	0123742269
	Author	David A. Rosenbaum	**Publisher**	Academic	**Publish year**	2010

Notes for reference

Goals to be achieved

1） 脳機能を明らかにするための計算論的なアプローチの手法を理解する
2） ヒトの滑らかな運動を実現する情報処理システムや学習機能について理解する
1） Understand the method of computational approach to reveal brain function
2） Understand the information processing system and learning function to achieve a skillful movement of the human

Evaluation of achievement

レポート 50%　最終日のプレゼンテーション 50%　左記の割合で総合的に評価する
A：達成目標をすべて達成しており，かつテスト・レポートの合計点（100 点満点）が 80 点以上
B：達成目標を〇%達成しており，かつテスト・レポートの合計点（100 点満点）が 65 点以上
C：達成目標を〇%達成しており，かつテスト・レポートの合計点（100 点満点）が 55 点以上

Report 50% Final presentation 50%, A: 100-80, B: 79-65, C: 64-55, D (fail): 54-0
Students who attend all classes will be evaluated as follows:
A: Achieved all goals and obtained total point of report and final presentation, 80 or higher (out of 100 points).
B: Achieved 85 % of goals and obtained total point of report and final presentation, 65 or higher (out of 100 points).
C: Achieved 70 % of goals and obtained total point of report and final presentation, 55 or higher (out of 100 points).

Examination
レポートで実施
By Report

Details of examination

Other information

Reference URL

Office hours
Monday 16:20-17:50
Monday 16:20-17:50

Relations to attainment objectives of learning and education

Key words
生体情報、運動情報処理、ニューラルネットワーク、計算論
Biological information, Motor Control System, Neural network, Computational theory

(M43630340)Statistical Natural Language Processing[Statistical Natural Language Processing]

Subject name[English]	Statistical Natural Language Processing[Statistical Natural Language Processing]				
Schedule number	M43630340	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Spring1 term	**Day of the week,period**	Wed.3～3	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Computer Science and Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	秋葉 友良 AKIBA Tomoyoshi				
Numbering	CMP_MAS52525				

Objectives of class

Important topics on statistical natural language processing will be discussed by focusing on statistical machine translation.

Contents of class

Week 1: Introduction
Week 2: Basic of Probability and Statistics
Week 3: Language Models
Week 4: Translation Models
Week 5: Parameter Estimation
Week 6: EM Algorithm
Week 7: Advanced methods in SMT

Self Preparation and Review

Related subjects

Information theory, Formal language theory

Notes for textbook

Resumes will be provided, which are based on:
・Kevin Knight
A Statistical MT Tutorial Workbook
・Seiichi Nakagawa et al.
Spoken Language Processing and Natural Language Processing

Reference1	**Book title**	Statistical Machine Translation			**ISBN**	978-0521874151
	Author	Philipp Koehn	**Publisher**	Cambridge University Press	**Publish year**	2010
Reference2	**Book title**	A Statistical MT Tutorial Workbook			**ISBN**	
	Author	Kevin Knight	**Publisher**		**Publish year**	

Notes for reference

Goals to be achieved

Basics: Understand the basic concepts of natural language processing
Natural Language Processing: Understand the role of language resources, language and translation models, word alignments, and parameter estimation methods,
Applications: Understand statistical machine translation system.

Evaluation of achievement

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
Reference URL http://www.cl.ics.tut.ac.jp/~akiba/
Office hours 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

(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**	M1
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	ENV_MAS65015				

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

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Supervisor(s)

Reference URL

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

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

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

(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
Charge teacher name[Roman alphabet mark]	岩佐 精二, 柴富 一孝 IWASA Seiji, SHIBATOMI Kazutaka				
Numbering	ENV_MAS52225				

Objectives of class

To provide you with a working knowledge of advanced synthesis of molecular materials.

Contents of class

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

Subjects related to Organic Chemistry

Notes for textbook

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

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

Evaluation of achievement

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.
Evaluation basis] Students who attend all classes will be evaluated as follows:
S: Achieved all goals and obtained total points of exam and reports, 90 or higher (out of 100 points).
A: Achieved 80 % goals and obtained total points of exam and reports, 80 or higher (out of 100 points).
B: Achieved 70 % of goals and obtained total points of exam and reports, 70 or higher (out of 100 points).
C: Achieved 60 % of goals and obtained total points of exam and reports, 60 or higher (out of 100 points).

Examination

レポートで実施
By Report

Details of examination

Other information

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.siorgchem.ens.tut.ac.jp/index.html
http://ens.tut.ac.jp/orgchem/

Office hours

anytime.

Relations to attainment objectives of learning and education

Key words

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
Charge teacher name[Roman alphabet mark]	吉田 祥子, 沼野 利佳 YOSHIDA Sachiko, NUMANO Rika				
Numbering	ENV_MAS53225				

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.

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,
We pick up topics from chapter2 in Neuron To Brain 4th Ed.
(8)Neural inducer in vertebrates
(9)Notch and Delta genes
(10)Notch and Delta genes
(11)Polarity and Segmentation
(12)Polarity and Segmentation
(13)Hox gene function in the nervous system
(14)Hox gene function in the nervous system
(15)Topic & Discussion

Self Preparation and Review

Related subjects

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)

Notes for reference

Goals to be achieved

Evaluation of achievement

Yoshida S.
S: Achieved all goals and obtained points of reports and discussions, 90 or higher (out of 100 points).
A: Achieved several goals and obtained points of reports and discussions, 80 or higher (out of 100 points).
B: Achieved two goals and obtained points of reports and discussions, 70 or higher (out of 100 points).
C: Achieved one goal and obtained points of reports and discussions, 60 or higher (out of 100 points).

Numano
Term report; 100%

Examination その他 Other
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
Reference URL https://lms.imc.tut.ac.jp
Office hours Make an appointment by e-mail.
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
Charge teacher name[Roman alphabet mark]	田中　三郎, 有吉　誠一郎 TANAKA Saburo, ARIYOSHI Seiichiro				
Numbering	ENV_MAS54225				

Objectives of class

This course will provide the students with the opportunity to study on his/her research subject in Electromagnetism and its relation with environmental technology by reading textbooks. 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 in English, and report and discuss deeply on research subject in the seminar.
Schedule of the week
1. Introduction of Sensor
2. Classification of Sensor
3. Sensor Technology
4. Basic Fabrication Process I
5. Basic Fabrication Process II
6-15. Oral presentation and discussion by students
16. Exam.

Self Preparation and Review

Related subjects

Electromagnetism

Notes for textbook

to be handed out

Reference1	**Book title**	Semiconductor Sensors			**ISBN**	ISBN 0-471-54609-7
	Author	S. M. Sze	**Publisher**	Wiley – Interscience Publication	**Publish year**	1994

Notes for reference

Goals to be achieved

Understanding of the fundamental of a sensor and its manufacturing process.

Evaluation of achievement

The evaluation is based on the scores of reading textbook, discussions, reports, presentations in the seminar and final examination.

Examination

定期試験を実施（対面）
Examination(Face to Face)

Details of examination

The exam is written in English.

Other information

Room G605, ext6916, e-mail: tanakas@ens.tut.ac.jp

Reference URL

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

Office hours

Anytime, but appointment on ahead is required by e-mail.

Relations to attainment objectives of learning and education

Key words

Electromagnetism, biomagnetism

(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**	Thu.2～2	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Environmental and Life Sciences			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	小口 達夫 OGUCHI Tatsuo				
Numbering	ENV_MAS52225				

Objectives of class

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.

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.

Contents of class

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

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

Self Preparation and Review

Related subjects

Notes for textbook

(Textbook is not used.)

(Textbook is not used.)

Notes for reference

(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.

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

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.

(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
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	ENV_MAS53225				

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

成績は指導教員が総合的に判断する。
A:達成目標をすべて達成しており，かつテスト・レポートの合計点(100 点満点)が 80 点以上
B:達成目標を 65%達成しており，かつテスト・レポートの合計点(100 点満点)が 65 点以上
C:達成目標を 55%達成しており，かつテスト・レポートの合計点(100 点満点)が 55 点以上

His/her supervisor evaluates the scores.
A: 80 or higher (out of 100 points), B: 65 or higher (out of 100 points) C: 55 or higher (out of 100 points)

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Supervisor

Reference URL

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

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
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	ENV_MAS54225				

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

成績は指導教員が総合的に判断する。
A:達成目標をすべて達成しており，かつテスト・レポートの合計点(100 点満点)が 80 点以上
B:達成目標を 65%達成しており，かつテスト・レポートの合計点(100 点満点)が 65 点以上
C:達成目標を 55%達成しており，かつテスト・レポートの合計点(100 点満点)が 55 点以上

His/her supervisor evaluates the scores.
A: 80 or higher (out of 100 points), B: 65 or higher (out of 100 points) C: 55 or higher (out of 100 points)

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Supervisor

Reference URL

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

(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			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	ENV_MAS54125				

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

成績は指導教員が総合的に判断する。
A:達成目標をすべて達成しており，かつテスト・レポートの合計点(100 点満点)が 80 点以上
B:達成目標を 65%達成しており，かつテスト・レポートの合計点(100 点満点)が 65 点以上
C:達成目標を 55%達成しており，かつテスト・レポートの合計点(100 点満点)が 55 点以上

His/her supervisor evaluates the scores.
A: 80 or higher (out of 100 points), B: 65 or higher (out of 100 points) C: 55 or higher (out of 100 points)

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Supervisor

Reference URL

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

(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
Charge teacher name[Roman alphabet mark]	水嶋 生智 MIZUSHIMA Takanori				
Numbering	ENV_MAS52225				

Objectives of class

固体触媒の分析手段である、X 線回折法、X 線吸収微細構造(XAFS)、蛍光 X 線法等の X 線分光技術に関する知識を習得する
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) X 線分光の基礎
(2) X 線回折法の原理、測定、応用
(3) X 線回折法の実習
(4) XAFS の原理、測定、解析
(5) 触媒特性化における XAFS の応用
(6) 特殊な XAFS 測定技術とその応用
(7) 蛍光 X 線分光の原理、測定、応用
(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

物理化学および無機化学の基礎的知識を有することが望ましい
It is advisable to have basic knowledge of physical and inorganic chemistry.

Notes for textbook

教科書は使用しない。プリントを配布する。

参考文献
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) X 線分光の基礎を理解する。
(2) 固体触媒の分析手段である X 線回折法、XAFS、蛍光 X 線分光を理解する。

(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.

Evaluation of achievement

レポート 100%
Reports 100%

Examination
レポートで実施
By Report

Details of examination

Other information
水嶋　生智, room : B-303, e-mail: mizushima@ens.tut.ac.jp
Takanori Mizushima, room : B-303, e-mail: mizushima@ens.tut.ac.jp

Reference URL

Office hours
随時
Anytime

Relations to attainment objectives of learning and education

Key words
X 線分光, X 線回折法, XAFS, 蛍光 X 線分光, 固体触媒
X-ray spectroscopy, X-ray diffraction, XAFS, Fluorescent X-ray spectroscopy, Solid catalysts

(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
Charge teacher name[Roman alphabet mark]	辻 秀人, 手老 龍吾 TSUJI Hideto, TERO Ryugo				
Numbering	ENV_MAS52225				

Objectives of class

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.

Contents of class

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.

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.

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.

Self Preparation and Review

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)

Related subjects

Notes for textbook

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

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).

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)

[Evaluation basis] Students who attend all classes will be evaluated as follows:
S: Achieved all goals and obtained total points of presentation or reports, 90 or higher (out of 100 points).
A: Achieved 80 % of goals and obtained total points of presentation or reports, 80 or higher (out of 100 points).
B: Achieved 70 % of goals and obtained total points of presentation or reports, 70 or higher (out of 100 points).
C: Achieved 60 % of goals and obtained total points of presentation or reports, 60 or higher (out of 100 points).

Examination

その他
Other

Details of examination

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)

Reference URL

Office hours

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

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

Key words

(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
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering	ARC_MAS51025				

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

Other

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**	M1
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering	ARC_MAS51025				

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

Other

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**	M2
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering	ARC_MAS51025				

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

(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**	1～1
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 kakukyouin				
Numbering	ARC_MAS51025				

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

Other

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**	2～2
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 kakukyouin				
Numbering	ARC_MAS51025				

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

試験期間中には何も行わない

None during exam period

Details of examination

Other information

Refer to administration office.

Reference URL

Refer to the URL of each 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**	M1
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering	ARC_MAS51025				

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

レポートで実施

By Report

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	松井 智哉 MATSUI Tomoya				
Numbering	ARC_MAS51025				

Objectives of class

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.

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.

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.3～3	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Architecture and Civil Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	松本　博 MATSUMOTO Hiroshi				
Numbering	ARC_MAS51025				

Objectives of class

本コースは，主として建物における室内空気質と換気の良好な室内空気環境を実現するための実践的方法を提示することを目的とする。授業では室内気候とその制御に関する新しい技術と方法に関連した知識を学び，高い専門性を身につけることを目標とする。

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.

Contents of class

本コースは，建物における良好な空気環境を実現するための室内空気質の制御と換気手法を専門的に高いレベルで理解するための導入として提供される。本コースは以下のトピックスで構成される。

1. 室内空気環境の概要
2. 建物由来の疾病と室内空気質
3. 室内空気の物理的・化学的特徴
4. 空気汚染物質の測定技術
5. 材料の化学物質放散と吸脱着のモデリング
6. 室内空気質の予測手法
7. 空気流動の CFD 解析
8. 換気システムの性能評価
9. 汚染物質制御のための換気システム設計
10. IAQ に関するガイドライン，コード及び基準
11. IAQ に関する最近の研究開発（1）
12. IAQ に関する最近の研究開発（2）
13. IAQ に関する最近の研究開発（3）
14. IAQ 問題に関する討論
15. 補講

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:

1. Overview of 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 on IAQ
11. Current research and development on IAQ (1)
12. Current research and development on IAQ (2)
13. Current research and development on IAQ (3)
14. Discussion on IAQ related issues
15. Supplementary lecture

Self Preparation and Review

Related subjects

Notes for textbook
関連する資料を配布
The related handouts will be distributed.

Notes for reference

Goals to be achieved
本コースは，シックビルディングシンドロームの背景と室内空気質を制御することによって良好な空気環境を実現するための実践的な手法を理解し，健康的で持続可能な建築を提示することを達成目標にする。
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
本科目に関連するレポートを課し，その達成度をいよって評価する。
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
E-mail: matsu@ace.tut.ac.jp
Email: matsu@ace.tut.ac.jp

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words
室内空気質，健康建築，シックビル症候群，換気
Indoor Air Quality, Healthy Building, Sick Building Syndrome, Ventilation

(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
Charge teacher name[Roman alphabet mark]	浅野　純一郎, 小野　悠 ASANO Junichiro, ONO Haruka				
Numbering	ARC_MAS51025				

Objectives of class

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.

Contents of class

The major topics that will be addressed in this class are the followings.
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.
5. Overview of newer paradigm of Urban planning in the world, especially smart growth, city compactness etc.
Reporting textbook "Urban Planning System in Japan 2nd Edition" and doing workshop about land readjustment project and district planning.

Self Preparation and Review

Fundamentally, this lecture's goal would be achieved by learning and researching for the small topics for themselves. the contents of topics would be explained in the lectures.

Related subjects

The following knowledge is desirable,
1) The basic knowledge on modern urban planning
2) The knowledge on urban planning system in your country

Notes for textbook

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

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.

Examination

レポートで実施
By Report

Details of examination

By report

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.

Office hours

Relations to attainment objectives of learning and education

Key words

District planning, Land use control system, Land readjustment, urban design, city shrinkage

(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**	Tue.4～4	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Architecture and Civil Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	渋澤 博幸 SHIBUSAWA Hiroyuki				
Numbering	ARC_MAS51025				

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
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering	ARC_MAS51025				

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

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

Examination

レポートで実施

By Report

Details of examination

Report

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
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering	ARC_MAS51025				

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

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

Examination

レポートで実施

By Report

Details of examination

Report

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
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering	ARC_MAS51025				

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

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

Examination

レポートで実施

By Report

Details of examination

Report

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(M45630280)Advanced Architectural Planning[Advanced Architectual Planning]

Subject name[English]	Advanced Architectural Planning[Advanced Architectual Planning]				
Schedule number	M45630280	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Tue.2～2	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Architecture and Civil Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	水谷　晃啓 MIZUTANI Akihiro				
Numbering	ARC_MAS51025				

Objectives of class

公共建築および社会基盤施設を計画する場合に、それらを計画するという事は、何を、どのように考えて計画する事なのかを学ぶ。

Architectural planning is a basic theory for designing buildings. Fundamentally, The field focused on the functionality and the relationship between people's activities and spaces without an architect's design sense.

Some countries have something like this field (For example, Japanese, America, Sweden, Netherlands, and UK).

Contents of class

1 ガイダンス、「建築計画とは？」
2 集まって住むにはどうすればいいですか？ - 住宅、集合住宅 1
3 どうやって一緒に住んでいますか？ - 住宅、集合住宅 2
4 学校建築とは何か - 教会への教育機関へ
5 学校建築とは何ですか？ -日本国内の動きと日本国外の事例
6 保育園と幼稚園
7 図書館でできること
8 病院の発展
9 なぜ保育園が必要なのですか？
10 オフィス - アーキテクチャは作業スタイルをサポートできますか？
11 劇場 - 劇場の発展
12 博物館で何ができますか？
13 人間のスケールと身体との関係
14 私たちは都市でどのような公共の場所を使用していますか？
15 日本における建築計画のまとめ

1　Guidance, "What is Architectural Planning?"
2　How do we live together？ －　Housing、Collective Housing1
3　How do we live together？ －　Housing、Collective Housing2
4　What is school architecture？ － Toward Church to Educational institute
5　What is school architecture？ Movement of Japan and Europe
6　Nursery and Kindergarten
7　What can we do in a library？
8　The development of Hospital
9　Why do we need nursery ？
10　Office － Can architecture support the work style?
11　Theater －　The development of theaters
12　What can we do in a museum？
13　The relationship between Human scale and a body
14　What public place do we use in a city?
15　Summary of Architectural Planning in Jppan

Self Preparation and Review

各回のテーマに関連する建築を可能な限り訪れ、その社会的状況について調べ、あなたなりの考えを述べることができるよう準備をしてきてください。

Please visit the buildings related to each theme as much as possible, investigate the its social situation, and prepare to describe your thoughts.

Related subjects

計画序論
建築設計演習ⅠからⅥ
建築設計演習基礎

Notes for textbook

Notes for reference

Please refer them(sorry, Japanese only).

建築設計資料集成・総合編・日本建築学会編(丸善、2001 年)
建築設計資料集成・拡張編・集会・市民サービス・日本建築学会編(丸善、2002 年)

Goals to be achieved

公共建築および社会基盤施設の計画立案のための基礎理論を習得する。
Master the basic theory for designing planning of public buildings.

Evaluation of achievement

レポート 70% その他授業中の質疑応答など 30% 左記の割合で、総合的に評価する。

評価基準:原則的にすべての講義に出席したものにつき、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ており, かつテスト・レポートの合計点(100 点満点)が 80 点以上
B:達成目標を〇%達成しており, かつテスト・レポートの合計点(100 点満点)が 65 点以上
C:達成目標を〇%達成しており, かつテスト・レポートの合計点(100 点満点)が 55 点以上
The grades will be evaluated by comprehensive consideration based on discussion (30%) and reports (70%) in the course.

[Evaluation basis] Students who attend all classes will be evaluated as follows:
A: Achieved all goals and obtained total points of reports, 80 or higher (out of 100 points).
B: Achieved 70 % of goals and obtained total points of reports, 65 or higher (out of 100 points).
C: Achieved 60 % of goals and obtained total points of reports, 55 or higher (out of 100 points).

Examination

レポートで実施
By Report

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

Architectural Planning、space composition、Human life, Culture, Behavior and Activities, function

(M45630330)Geohazards[Geohazards]

Subject name[English]	Geohazards[Geohazards]				
Schedule number	M45630330	**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			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	松田　達也 MATSUDA Tatsuya				
Numbering	ARC_MAS51025				

Objectives of class

The objective are to underdstand the characteristics of geo-hazards such as earthquakes, landslides,and flloodings and to learn environment planning to mitigate the disasters.

The objective are to underdstand the characteristics of geo-hazards such as earthquakes, landslides,and flloodings and to learn environment planning to mitigate the disasters.

Contents of class

1 : An introduction to geology and planning
2 : Earthquakes and faulting
3 : Volcanic activity
4 : Soil properties and problems
5 : Landslides
6 : Subsidence
7 : Coastal Process
8 : Flooding
9 : Groudwater
10 : Waste treatment
11 : Mineral resouses
12 : Energy resources
13 : Environmental planning
14 : Environmental law

1 : An introduction to geology and planning
2 : Earthquakes and faulting
3 : Volcanic activity
4 : Soil properties and problems
5 : Landslides
6 : Subsidence
7 : Coastal Process
8 : Flooding
9 : Groudwater
10 : Waste treatment
11 : Mineral resouses
12 : Energy resources
13 : Environmental planning
14 : Environmental law

Self Preparation and Review

Related subjects

Geotechnical Analysis, Advanced Geotechnical Engineering and Hazard Mitigation

Geotechnical Analysis, Advanced Geotechnical Engineering and Hazard Mitigation

Notes for textbook

None

None

Notes for reference

Goals to be achieved

・Understanding the characteristics of geohazards such as earthquake,landslide and flooding.
・Understanding the land use planning and law for mitigation of the disaster.
・Understanding the characteristics of geohazards such as earthquake,landslide and flooding.
・Understanding the land use planning and law for mitigation of the disaster.

Evaluation of achievement

Report and the presentation of the report.
S: Obtained total points, 90 or higher (out of 100 points).
A: Obtained total points, 80 or higher (out of 100 points).
B: Obtained total points, 70 or higher (out of 100 points).
C: Obtained total points, 60 or higher (out of 100 points).
Report and the presentation of the report.
S: Obtained total points, 90 or higher (out of 100 points).
A: Obtained total points, 80 or higher (out of 100 points).
B: Obtained total points, 70 or higher (out of 100 points).
C: Obtained total points, 60 or higher (out of 100 points).

Examination

レポートで実施
By Report

Details of examination

Other information

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E-mail:t.matsuda@ace.tut.ac.jp
office:D-808
Tel:0532-44-6849
E-mail:t.matsuda@ace.tut.ac.jp

Reference URL

preparing
preparing

Office hours

12:00-13:00 on Wednesday
12:00-13:00 on Wednesday

Relations to attainment objectives of learning and education

Key words

geohazard, mitigation planning
geohazard, mitigation planning

(M45630350)Water Environment Engineering[Water Environment Engineering]

Subject name[English]	Water Environment Engineering[Water Environment Engineering]				
Schedule number	M45630350	**Subject area**	Advanced Architecture and Civil 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	Architecture and Civil Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	井上 隆信, 横田 久里子 INOUE Takanobu, YOKOTA Kuriko				
Numbering	ARC_MAS51025				

Objectives of class

To know and understand the water quality change in environment and treatment system.
To know and understand the water quality management.

Contents of class

Water pollutants and management
1-2 environmental standard
3-5 nutrients, organic matter
6-7 chemicals in water environment
(Yokota)

drinking water treatment and waste water treatment
8-9 rapid sand filtration process
10-11 activated sludge treatment process
water quality change in environment and treatment system.
12 fundamental equation of the mass balance
13 piston flow model
14 complete mixing model
15 reaction rate
(Inoue)

Self Preparation and Review

Related subjects

Notes for textbook

No textbook is required for this class.

Notes for reference

Goals to be achieved

To understand the water pollution and environmental quality standard.

Evaluation of achievement

[Evaluation basis] Students who attend all classes will be evaluated as follows:
A: Achieved all goals and obtained total points of reports and presentation, 80 or higher (out of 100 points).
B: Achieved 65 % of goals and obtained total points of reports and presentation, 65 or higher (out of 100 points).
C: Achieved 55 % of goals and obtained total points of reports and presentation, 55 or higher (out of 100 points).

Examination

レポートで実施
By Report

Details of examination

Other information

Reference URL

Office hours

Wednesday 12:00- 13:00
Relations to attainment objectives of learning and education
Key words

(M45630360)Advanced Transportation and Traffic Engineering[Advanced Transportation and Traffic Engineering]

Subject name[English]	Advanced Transportation and Traffic Engineering[Advanced Transportation and Traffic Engineering]				
Schedule number	M45630360	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Fri.2～2	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Architecture and Civil Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	杉木　直 SUGIKI Nao				
Numbering	ARC_MAS51025				

Objectives of class

To obtain the advanced knowledge of theories and methods for policies and planning for transportation and urban structure.

Contents of class

By using reports and papers on transportation and urban structure, students learn the advanced transportation theories and methods. Discussion between the lecturer and students will be performed in the lecture time.

Self Preparation and Review

Related subjects

Advanced Transportation System and Transport Economics

Notes for textbook

Textbooks and scientific papers shall be announced at the start of the class.

Notes for reference

Goals to be achieved

1.To understand the necessity and significance of policy and planning for transportation and urban structure.
2.To understand theories and methodologies in the above mentioned fields.

Evaluation of achievement

Evaluation of achievement: The academic score of each student is evaluated by reports (100%).
Criteria of evaluation: Score A is 80 or higher, score B is 65 or higher to lower than 80, score C is 55 or higher to lower than 65.

Examination

レポートで実施
By Report

Details of examination

Other information

N. Sugiki：D-705, 6833, sugiki@ace.tut.ac.jp

Reference URL

N. Sugiki: https://sites.google.com/site/trlabotut/home-en

Office hours

At any time. Please contact Sugiki by e-mail in advance.

Relations to attainment objectives of learning and education

Key words

Transportation system, Urban structure, Simulation model, Evaluation method