Syllabus

International Master′s Degree Program

（2021-Spring Term）

(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**	Thu.5～5	**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, Applied Chemistry and Life Science			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	穂積 直裕, 大門 裕之, Lim Pang Boey, 岡田 浩, 岩佐 精二, 畑山 要介, 髙嶋 孝明, 蔡 万里, 中村 大介, 武藤 浩行, 和泉 司, 社河内 友里, 齊藤 大樹, S総合ー教務委員 HOZUMI Naohiro, DAIMON Hiroyuki, Lim Pang Boey, OKADA Hiroshi, IWASA Seiji, HATAYAMA Yosuke, TAKASHIMA Takaaki, SAI Banri, NAKAMURA Daisuke, MUTO Hiroyuki, IZUMI Tsukasa, SHAKOUCHI Yuri, SAITOH Taiki, Sougou kyoiku kyomu Iin				
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. on-demand 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.

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

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

4. on-demand Okada "History and Today of Measurement"
Measurement is a fundamental part not only in science and engineering but also in our daily life. Now, most of the measurement units are standardized in the world, however, we can find out unique aspects of the country from their measurement system. This class introduces history and today of measurement in Japan.

5. on-demand 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—

6. on-demand Hatayama "Social problems in Japan"
Modern Japanese society faces many social problems derived from conflict between conventional institutions and social changes. This lecture especially focuses on problems related with isolation including "Hikikomori" which have broadly known as inherent problems in Japan.

7. on-demand 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.

8. on-demand Sai "The legal system of Intellectual Property in Japan"
In modern information society, technological and cultural reforms progress very quickly. And this progress has been based on what is known as intellectual rights such as patent right, trademark right, copyright, and other rights related to intellectual property.
Intellectual property issues cause a number of problems which have attracted much interest in the present society. This class explains the Japanese legal system of Intellectual property, in particular focusing on the legal protection of patent right and

copyright in Japan.

9. on-demand　Nakamura "Cinema of Japan"
Japan is recognized as one of the most creative countries in the movie culture. This class presents the method of "shot analysis", referring to some Japanese classical films.

10. on-demand　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.

11. on-demand　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.

12. on-demand　Shakouchi "Cultural Differences in Animation Movies"
When some Japanese animation movies are translated into foreign languages, not only words but also other elements of the movies are changed. Why? What do all these changes mean? We would like to discuss the meaning of these changes in terms of the contextual differences in different cultures.

13. on-demand　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.

14. on-demand　To be decided

Self Preparation and Review

Review each lecture and prepare for the next class with reference to the textbook.

Related subjects
N/A

Notes for textbook
Papers(resume) will be distributed.

Notes for reference
N/A

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:
S: Achieved all goals and obtained total points of exam and reports, 90 or higher (out of 100 points).
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, 70 or higher (out of 100 points).
C: Achieved at least 55 % of goals and obtained total points of exam and reports, 60 or higher (out of 100 points).

Examination
試験期間中には何も行わない
None during exam period

Details of examination
N/A

Other information
N/A

Reference URL
N/A

Office hours

After each class.

Relations to attainment objectives of learning and education

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, Applied Chemistry and Life Science			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	村松　由起子 MURAMATSU Yukiko				
Numbering	GEN_LIB51425				

Objectives of class

初級日本語会話の科目です。日本人とコミュニケーションができるよう，初級レベルの文法と語彙を学びます。

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

Contents of class

日本語初級の教科書「はかせ」を使います。

1．発音
2．L.1
3．L.2
4．L.3
5．L.4
6．L.5
7．L.6
8．L.7
9．L.8
10．L.9
11．L10
12．L.11
13．L.12
14．L.13 & 期末試験

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.　&　Active learning
9. Lesson 8 Kyooshitsu ni dare ga imasu ka.　&　Active learning
10.Lesson 9 Yuubinkyoku wa doko ni arimasu ka.　&　Active learning
11.Lesson 10 Nihon e robotto no kenkyuu ni kimashita.　&　Active learning
12.Lesson 11 Fuji-san wa kireina yama desu.　&　Active learning
13.Lesson 12 Ryokoo wa doo deshita ka.　&　Active learning
14.Lesson 13 Shuumatsu ni nani oshitai desu ka.　&　Active learning　&　Term exam.

Self Preparation and Review

語彙，Notes を予習しておいてください。(90 分)
毎回復習として「Structures」を覚えてください。(90 分)
Preparation: Please read Vocabulary and Notes in each lesson.(90 min.)
Review:Please memorize "Structures" after each lesson.(90 min.)

Related subjects

Basic Japanese Classes(にほんごほこう)
Basic Japanese Classes (Nihongo Hokoo)
For more information,please see the following URL: http://ignite.tut.ac.jp/cir/students/program/hokou.html

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
¥2,000(税抜き)
¥2,000(+tax)

Notes for reference
特になし
N/A

Goals to be achieved
1)日本語初級の文型を理解することができる。
2)やさしい日本語を使って日本人とコミュニケーションができる。
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
宿題と練習40%, 期末試験60%の割合で評価する。
S: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 90 点以上
A:達成目標を 80%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 70%達成しており, かつテスト・レポートの合計点(100 点満点)が 70 点以上
C:達成目標を 60%達成しており, かつテスト・レポートの合計点(100 点満点)が 60 点以上
Homework＆Active learning 40%, Examination 60%
Evaluation criteria:
Students who attend all classes will be evaluated as follows:

S: Total points obtained from exams and homework, 90 or higher (out of 100 points).
A: Total points obtained from exams and homework, 80 or higher (out of 100 points).
B: Total points obtained from exams and homework, 70 or higher (out of 100 points).
C: Total points obtained from exams and homework, 60 or higher (out of 100 points).

Examination
定期試験を実施(対面)
Examination(Face to Face)

Details of examination
特になし
N/A

Other information
特になし
N/A

Reference URL
特になし
N/A

Office hours
火曜日 13:00-13:30

Tuesday 13:00-13:30

Relations to attainment objectives of learning and education

機械工学専攻
(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で, 自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
電気・電子情報工学専攻
(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で, 自らの考えや成果を効果的に表現するコミュニ

ケーション力を身につけている。
情報・知能工学専攻
(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
応用化学・生命工学専攻
(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
建築・都市システム学専攻
(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。

Graduate Program of Mechanical Engineering for Master's Degree
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members
Graduate Program of Electrical and Electronic Information Engineering for Master's Degree
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members
Graduate Program of Computer Science and Engineering for Master's Degree
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members
Graduate Program of Applied Chemistry and Life Science for Master's Degree
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members
Graduate Program of Architecture and Civil Engineering for Master's Degree
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members

Key words
Basic Japanese

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

Subject name[English]	Seminar on Mechanical Engineering I[Seminar on Mechanical Engineering I]				
Schedule number	M41610010	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	4
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Mechanical Engineering			**Beggining grade**	M1, M2
Charge teacher name[Roman alphabet mark]	S1系教務委員 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.

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.

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

Different in each laboratory

Different in each laboratory

Related subjects

Different in each laboratory

Different in each laboratory

Notes for textbook

Different in each laboratory

Different in each laboratory

Notes for reference

N/A

N/A

Goals to be achieved

To acquire fundamental knowledge of individual research fields.

To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.

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

Holding meetings to report tasks for each laboratory and comprehensively evaluating the results including contents, materials and attitudes.

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

Holding meetings to report tasks for each laboratory and comprehensively evaluating the results including contents, materials and attitudes.

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

Examination

試験期間中には何も行わない

None during exam period

Details of examination

N/A

N/A

Other information

N/A

N/A

Reference URL

Different in each laboratory
Different in each laboratory

Office hours

Different in each laboratory
Different in each laboratory

Relations to attainment objectives of learning and education

機械工学専攻
（C）高度な知識を統合的に活用できる実践力・創造力
機械工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。
(C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。
(C2)機械工学およびその関連分野の広範囲の知識の連携により，研究開発に対する方法論を体得して，研究開発の計画を立案および実践し，課題解決のための新たな技術を創造できる能力を身につけている。
（D）グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
(D1)論文，口頭及び情報メディアを通じて，自分の論点や考えなどを国の内外において効果的に表現・発信し，コミュニケーションする能力を身につけている。

Graduate Program of Mechanical Engineering for Master's Degree
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge forproblem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineering and related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about mechanical engineering and related fields; to make plans for research and development and put them intopractice; and to create new technologies to solve problems
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media

Key words

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

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

Subject name[English]	Seminar on Mechanical Engineering II[Seminar on Mechanical Engineering II]				
Schedule number	M41610020	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～
Department Offered	Mechanical Engineering			**Beggining grade**	M2
Charge teacher name[Roman alphabet mark]	S1系教務委員 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.

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.

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Self Preparation and Review

Given by supervisors.

Given by supervisors.

Related subjects

N/A

N/A

Notes for textbook

Given by supervisors.

Given by supervisors.

Notes for reference

N/A

N/A

Goals to be achieved

To acquire fundamental knowledge of individual research fields.

To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.

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

Evaluated comprehensively by content, reports, considerations, etc. of presentation in each laboratory.

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

Evaluated comprehensively by content, reports, considerations, etc. of presentation in each laboratory.

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

Examination

試験期間中には何も行わない

None during exam period

Details of examination

N/A

N/A

Other information

For any questions, contact your supervisor.

For any questions, contact your supervisor.

Reference URL

N/A

N/A

Office hours

Contact your supervisor.

Contact your supervisor.

Relations to attainment objectives of learning and education

機械工学専攻

（C）高度な知識を統合的に活用できる実践力・創造力

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

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

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

（D）グローバルに活躍できるコミュニケーション力

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

(D1)論文，口頭及び情報メディアを通じて，自分の論点や考えなどを国の内外において効果的に表現・発信し，コミュニケーションする能力を身につけている。

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

（E）最新の技術や社会環境の変化に対する探究心と持続的学習力

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

Graduate Program of Mechanical Engineering for Master's Degree

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

Key words

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

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

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

Subject name[English]	Thesis Research on Mechanical Engineering[Thesis Research on Mechanical Engineering]				
Schedule number	M41610030	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Required
Time of starting a course	2Years	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Mechanical Engineering			**Beggining grade**	M1, M2
Charge teacher name[Roman alphabet mark]	S1系教務委員, 1系各教員 1kei kyomu Iin-S, 1kei kakukyouin				
Numbering	MEC_MAS61015				

Objectives of class

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

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

Contents of class

Follow instruction of supervisors.

Follow instruction of supervisors.

Self Preparation and Review

Follow instruction of supervisors.

Follow instruction of supervisors.

Related subjects

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

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

Notes for textbook

N/A

N/A

Notes for reference

N/A

N/A

Goals to be achieved

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

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

Evaluation of achievement

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

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

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

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

Examination

試験期間中には何も行わない

None during exam period

Details of examination

None during exam period
None during exam period

Other information

For any questions, contact your supervisor.
For any questions, contact your supervisor.

Reference URL

N/A
N/A

Office hours

Contact your supervisor.
Contact your supervisor.

Relations to attainment objectives of learning and education

(C)高度な知識を統合的に活用できる実践力・創造力
機械工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。
(C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。
(C2)機械工学およびその関連分野の広範囲の知識の連携により，研究開発に対する方法論を体得して，研究開発の計画を立案および実践し，課題解決のための新たな技術を創造できる能力を身につけている。
(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
(D1)論文，口頭及び情報メディアを通じて，自分の論点や考えなどを国の内外において効果的に表現・発信し，コミュニケーションする能力を身につけている。
(D2)チーム内の個々の要員の価値観を互いに尊重するとともに，協調して，チームとしての目標達成に寄与できる高い能力を身につけている。
(E)最新の技術や社会環境の変化に対する探究心と持続的学習力
社会，環境，技術等の変化に対応して，生涯にわたって自発的に計画し学習する能力を身につけている。

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge forproblem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineering and related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about mechanical engineering and related fields; to make plans for research and development and put them intopractice; and to create new technologies to solve problems
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high skills to mutually respect the values of individual team members; and to contribute to the team's achievements through working cooperatively with other team members
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, environment and technology

Key words

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

(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

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

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

Contents of class

Follow instruction of supervisors.

Follow instruction of supervisors.

Self Preparation and Review

Follow instruction of supervisors.

Follow instruction of supervisors.

Related subjects

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

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

Notes for textbook

N/A

N/A

Notes for reference

N/A

N/A

Goals to be achieved

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

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

Evaluation of achievement

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

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

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

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

Examination

試験期間中には何も行わない

None during exam period

Details of examination

None during exam period
None during exam period

Other information

For any questions, contact your supervisor.
For any questions, contact your supervisor.

Reference URL

N/A
N/A

Office hours

Contact your supervisor.
Contact your supervisor.

Relations to attainment objectives of learning and education

機械工学専攻
(C)高度な知識を統合的に活用できる実践力・創造力
機械工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。
(C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。
(C2)機械工学およびその関連分野の広範囲の知識の連携により，研究開発に対する方法論を体得して，研究開発の計画を立案および実践し，課題解決のための新たな技術を創造できる能力を身につけている。
(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
(D1)論文，口頭及び情報メディアを通じて，自分の論点や考えなどを国の内外において効果的に表現・発信し，コミュニケーションする能力を身につけている。
(D2)チーム内の個々の要員の価値観を互いに尊重するとともに，協調して，チームとしての目標達成に寄与できる高い能力を身につけている。
(E)最新の技術や社会環境の変化に対する探究心と持続的学習力
社会，環境，技術等の変化に対応して，生涯にわたって自発的に計画し学習する能力を身につけている。

Graduate Program of Mechanical Engineering for Master's Degree
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge forproblem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineering and related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about mechanical engineering and related fields; to make plans for research and development and put them intopractice; and to create new technologies to solve problems
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high skills to mutually respect the values of individual team members; and to contribute to the team's achievements through working cooperatively with other team members
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, environment and technology

Key words

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

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

Subject name[English]	Thesis Research on Mechanical Engineering[Thesis Research on Mechanical Engineering]				
Schedule number	M4161003T	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Mechanical Engineering			**Beggining grade**	M2
Charge teacher name[Roman alphabet mark]	S1系教務委員, 1系各教員 1kei kyomu Iin-S, 1kei kakukyouin				
Numbering	MEC_MAS61015				

Objectives of class

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

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

Contents of class

Follow instruction of supervisors.

Follow instruction of supervisors.

Self Preparation and Review

Follow instruction of supervisors.

Follow instruction of supervisors.

Related subjects

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

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

Notes for textbook

N/A

N/A

Notes for reference

N/A

N/A

Goals to be achieved

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

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

Evaluation of achievement

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

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

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

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

Examination

試験期間中には何も行わない

None during exam period

Details of examination

None during exam period
None during exam period

Other information

For any questions, contact your supervisor.
For any questions, contact your supervisor.

Reference URL

N/A
N/A

Office hours

Contact your supervisor.
Contact your supervisor.

Relations to attainment objectives of learning and education

機械工学専攻
(C)高度な知識を統合的に活用できる実践力・創造力
機械工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。
(C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。
(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
(D1)論文，口頭及び情報メディアを通じて，自分の論点や考えなどを国の内外において効果的に表現・発信し，コミュニケーションする能力を身につけている。
(D2)チーム内の個々の要員の価値観を互いに尊重するとともに，協調して，チームとしての目標達成に寄与できる高い能力を身につけている。
(E)最新の技術や社会環境の変化に対する探究心と持続的学習力
社会，環境，技術等の変化に対応して，生涯にわたって自発的に計画し学習する能力を身につけている。

Graduate Program of Mechanical Engineering for Master's Degree
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge forproblem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineering and related fields; and to utilize such knowledge in an integrated manner
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high skills to mutually respect the values of individual team members; and to contribute to the team's achievements through working cooperatively with other team members
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, environment and technology

Key words

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

(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**	2～2
Department Offered	Mechanical Engineering			**Beggining grade**	M2
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.

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.

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

Given by supervisors.

Given by supervisors.

Related subjects

N/A

N/A

Notes for textbook

Given by supervisors.

Given by supervisors.

Notes for reference

N/A

N/A

Goals to be achieved

To acquire fundamental knowledge of individual research fields.

To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.

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

Evaluated comprehensively by content, reports, considerations, etc. of presentation in each laboratory.

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

Evaluated comprehensively by content, reports, considerations, etc. of presentation in each laboratory.

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

Examination

試験期間中には何も行わない

None during exam period

Details of examination

N/A

N/A

Other information

For any questions, contact your supervisor.

For any questions, contact your supervisor.

Reference URL

N/A

N/A

Office hours

Contact your supervisor.

Contact your supervisor.

Relations to attainment objectives of learning and education

機械工学専攻

（C）高度な知識を統合的に活用できる実践力・創造力

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

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

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

（D）グローバルに活躍できるコミュニケーション力

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

(D1)論文，口頭及び情報メディアを通じて，自分の論点や考えなどを国の内外において効果的に表現・発信し，コミュニケーションする能力を身につけている。

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

（E）最新の技術や社会環境の変化に対する探究心と持続的学習力

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

Graduate Program of Mechanical Engineering for Master's Degree

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

Key words

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

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

(M41610050)Internship[Internship]

Subject name[English]	Internship[Internship]				
Schedule number	M41610050	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	0
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Mechanical Engineering			**Beggining grade**	M2
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS51015				

Objectives of class

Students are expected to address problems in a specialized field in a company or research institute. The objectives of this subject are to experience practical research and development and to cultivate the practical problem-solving ability, planning ability, and creativity.

Students are expected to address problems in a specialized field in a company or research institute. The objectives of this subject are to experience practical research and development and to cultivate the practical problem-solving ability, planning ability, and creativity.

Contents of class

In order to cultivate the practical problem-solving ability, academic and company/institutional supervisors will provide practical problems in a specialized field through close communication.

In order to cultivate the practical problem-solving ability, academic and company/institutional supervisors will provide practical problems in a specialized field through close communication.

Self Preparation and Review

Students are expected to discuss a preferable internship topic with supervisors before starting it.

Students are expected to discuss a preferable internship topic with supervisors before starting it.

Related subjects

N/A

N/A

Notes for textbook

Follow instructions provided by company/institutional supervisors.

Follow instructions provided by company/institutional supervisors.

Notes for reference

N/A

N/A

Goals to be achieved

While engaging practical activities in a company or research institution for several months, students are expected to improve the practical problem-solving ability, planning ability, and creativity as well as an international way of thinking.

While engaging practical activities in a company or research institution for several months, students are expected to improve the practical problem-solving ability, planning ability, and creativity as well as an international way of thinking.

Evaluation of achievement

Comprehensive evaluation based on students' reports and evaluation sheets by academic and company/institutional supervisors.

A: 80 or higher (out of 100 points), B: 65 or higher (out of 100 points) C: 55 or higher (out of 100 points)

Comprehensive evaluation based on students' reports and evaluation sheets by academic and company/institutional supervisors.

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

N/A

N/A

Other information

N/A

N/A

Reference URL

N/A
N/A

Office hours

N/A
N/A

Relations to attainment objectives of learning and education

機械工学専攻
(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
(D1)論文，口頭及び情報メディアを通じて，自分の論点や考えなどを国の内外において効果的に表現・発信し，コミュニケーションする能力を身につけている。
(D2)チーム内の個々の要員の価値観を互いに尊重するとともに，協調して，チームとしての目標達成に寄与できる高い能力を身につけている。

Graduate Program of Mechanical Engineering for Master's Degree
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high skills to mutually respect the values of individual team members; and to contribute to the team's achievements through working cooperatively with other team members

Key words

Internship
Internship

(M41630030)Applied Mechanics of Materials[Applied Mechanics of Materials]

Subject name[English]	Applied Mechanics of Materials[Applied Mechanics of Materials]				
Schedule number	M41630030	**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]	足立　忠晴 ADACHI Tadaharu				
Numbering	MEC_MAS53025				

Objectives of class

To understand mechanical performances of structures, and mechanical behaviors of solid and structures, fundamental mechanics of solid and structure is lectured. Especially, mechanics of thin-walled structures which is useful for practical design of mechanical structures is explained in detail.

Contents of class

1st week (face to face)
Chapter 1 Introduction
Chapter 2 Automobile Structures from View of Solid Mechanics
2nd week (face to face)
Chapter 3 Fundamentals of Structural Mechanics
Chapter 4 Forces and Moments Applying to Structures
3rd week (on-demand)
Chapter 3 Fundamentals of Structural Mechanics
Chapter 4 Forces and Moments Applying to Structures
4th week (on-demand)
Assignment (Chapters 3 & 4)
5th week (face to face)
Chapter 5 Elementary Mechanics of Structures
Chapter 6 Mechanics of Thin-Walled Structures
6th week (face to face)
Chapter 6 Mechanics of Thin-Walled Structures
7th week (on-demand)
Assignment (Chapters 5 & 6)

If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for
Preventing the Spread of Corona virus, the course content and evaluation of achievement are subject to change.
If there is any changes about a class schedule, I will inform you on Google Classroom or KYOMU JOHO SYSTEM.

Self Preparation and Review

To enhance a learning effect, students are encouraged to refer to their textbox etc. To prepare for and review the lecture for around 90 minutes each.
Problems given in each chapter must be solved by yourself to understand the contents of each chapter. By comparing solutions of some problems explained in the class, mechanics of solids will be understood deeply.

Related subjects

Mechanics of Materials, Elasticity, Solid Mechanics

Notes for textbook

Lessons are given by using handouts distributed in the class.

Reference1	**Book title**	A First Course in Continuum Mechanics			**ISBN**	
	Author	Fung YC	**Publisher**	Prentice-Hall	**Publish year**	
Reference2	**Book title**	Mechanics of Engineering Materials			**ISBN**	
	Author	Benham PP, Crawford RJ and Armstrong CG	**Publisher**	Longman	**Publish year**	
Reference3	**Book title**	Classical and Computational Solid Mechanics			**ISBN**	

	Author	Fung YC and Pin T	**Publisher**	World Scientific	**Publish year**	2001
Reference4	**Book title**	Theory of Elasticity, Course of Theoretical Physics Vol.7			**ISBN**	
	Author	Landau L.D. and Lifshitz E.M.	**Publisher**		**Publish year**	1970
Reference5	**Book title**	Aircraft Structures for Engineering Students			**ISBN**	
	Author	Megson THG	**Publisher**	Butterworth-Heinemann	**Publish year**	2007

Notes for reference

Many references related to the class are published. Reading the references is recommended by yourself.

Goals to be achieved

To understand physical meaning fundamental equations in solid mechanics.
To deeply understand elementary mechanics of materials (strength of materials); tension of bar, torsion of axis and bending of beam.
To understand mechanics of thin-walled structures.
To know concept of dynamic measurement of deformation.

Evaluation of achievement

S: Achieved all goals and obtained total points of reports, 90 or higher (out of 100 points).
A: Achieved 80% of 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, 70 or higher (out of 100 points).
C: Achieved 60% of goals and obtained total points of reports, 60 or higher (out of 100 points).

Examination

レポートで実施
By Report

Details of examination

Two assignments are conducted. Students must take every assignment.

Other information

Prof Tadaharu Adachi, Room D-305, Extension phone 6664, Email adachi@me.tut.ac.jp

Reference URL

http://solid.me.tut.ac.jp/solid/

Office hours

Anytime. Contact me by email before coming if possible.

Relations to attainment objectives of learning and education

(C1)機械工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。
(C) Practical and creative skills to utilize advanced knowledge in an integrated and progressive manner
Have advanced knowledge about mechanical engineering and related fields, and have ability to create and practice original techniques for problem solving by acquiring the research and development methodology that combines such knowledge in an extensive and organic manner.

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

Key words

Strength of materials, Mechanics of materials, solid mechanics, Structural mechanics, Thin-walled Structure

(M41630080)Science and Technology of Thin Films[Science and Technology of Thin Films]

Subject name[English]	Science and Technology of Thin Films[Science and Technology of Thin Films]				
Schedule number	M41630080	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Fri.2～2	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Mechanical Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	伊﨑　昌伸 IZAKI Masanobu				
Numbering	MEC_MAS54025				

Objectives of class

Understanding fundamental physics of solid materials, such as structure of atoms, electronic state of electron, bonding, symmetry of lattice, and scattering by electron, and the effects of the light and heat on the energy state and related physical properties, electrical and optical properties.

Contents of class

(Face-to-face) [1st] Chap. 1 : Structure of atoms
(on demand)[2nd] Chap. 1: Electron and quantum number, orbital
(on demand) 3rd] Chap. 2: Symmetry on Lattice
(on-demand) 4th] Chap.2 structures of alloys and compounds
(on demand) 5th] Chap. 2: Diffraction and Structural factor
(on demand) 6th] Chap. 2, Reciprocal space
(on demand) 7th] Chap. 3: Electrical property and semiconductors
(on demand) 8th] Chap. 3: Optical property and optics & Periodic exam. (45min)

Depending on the situation of the COVID-19 pandemic, lecture style will be flexibly changed from face-to-face to on-demand.

Self Preparation and Review

Review every time after the lecture and prepare for next lecture.Students must provide 90 minutes for preparation and review of each class.

Related subjects

N/A

Textbook1	**Book title**	Materials Science and Engineering (9th Edition)			**ISBN**	978-1118319222
	Author	William D. Callister, Jr., David G. Rethwisch	**Publisher**	Wiley	**Publish year**	2014

Notes for textbook

It is desirable to purchase the textbook, but the textbook can also be lent, so please consult with the instructor.
The relating handouts will be given in the class.

Notes for reference

N/A

Goals to be achieved

(1) Understand the electronic state of electron
(2) Understand the symmetry of lattice and scattering
(3) Understand the electrical and optical property of materials.

Evaluation of achievement

Evaluation basis: Students who attend all classes will be evaluated as follows.
Report:80%+Test:20%
S: achieve all objectives and total marks of reports and exam. over 80.
A: achieve all objectives and total marks of reports and exam. over 80.
B: achieve 3 objectives and total marks of reports and exam. over 70.
C: achieve 3 objectives and total marks of reports and exam. over 60.

Examination

定期試験を実施（対面）
Examination(Face to Face)

Details of examination
N/A

Other information
Masanobu Izaki, D-505, m-izaki@me.tut.ac.jp

Reference URL
http://tf,metut,.ac.jp

Office hours
Please send e-mail in advance for appointment.

Relations to attainment objectives of learning and education

Key words
electron, quantum number, semiconductor, optics

(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.

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.

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

Follow instruction of supervisors.

Follow instruction of supervisors.

Related subjects

Follow instruction of supervisors.

Follow instruction of supervisors.

Notes for textbook

Textbook or material will be made available from the supervisors.

Textbook or material will be made available from the supervisors.

Notes for reference

N/A

N/A

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.

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

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

Examination

試験期間中には何も行わない
None during exam period

Details of examination

N/A

N/A

Other information

For any questions, contact your supervisor.

For any questions, contact your supervisor.

Reference URL

N/A
N/A

Office hours

Contact your supervisor.
Contact your supervisor.

Relations to attainment objectives of learning and education

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge forproblem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineering and related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about mechanical engineering and related fields; to make plans for research and development and put them intopractice; and to create new technologies to solve problems

Key words

mechanical system design
mechanical system design

(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.

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.

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

Follow instruction of supervisors.

Follow instruction of supervisors.

Related subjects

Follow instruction of supervisors.

Follow instruction of supervisors.

Notes for textbook

Textbook or material will be made available from the supervisors.

Textbook or material will be made available from the supervisors.

Notes for reference

N/A

N/A

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.

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.

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

Coursework, presentation and/or report.

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

Examination

試験期間中には何も行わない

None during exam period

Details of examination

N/A

N/A

Other information

For any questions, contact your supervisor.

For any questions, contact your supervisor.

Reference URL

N/A
N/A

Office hours

Contact your supervisor.
Contact your supervisor.

Relations to attainment objectives of learning and education

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge forproblem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about mechanical engineering and related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about mechanical engineering and related fields; to make plans for research and development and put them intopractice; and to create new technologies to solve problems

Key words

Materials, Manufacturing Process
Materials, Manufacturing Process

(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.

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.

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

Follow instruction of supervisors.

Follow instruction of supervisors.

Related subjects

Follow instruction of supervisors.

Follow instruction of supervisors.

Notes for textbook

Textbook or material will be made available from the supervisors.

Textbook or material will be made available from the supervisors.

Notes for reference

N/A

N/A

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.

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.

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

Coursework, presentation and/or report.

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

Examination

試験期間中には何も行わない

None during exam period

Details of examination

N/A

N/A

Other information

For any questions, contact your supervisor.

For any questions, contact your supervisor.

Reference URL

N/A

N/A

Office hours

Contact your supervisor.

Contact your supervisor.

Relations to attainment objectives of learning and education

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

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

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

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

Key words

System, Control, Robotics

System, Control, Robotics

(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.

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.

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

Follow instruction of supervisors.

Follow instruction of supervisors.

Related subjects

Follow instruction of supervisors.

Follow instruction of supervisors.

Notes for textbook

Textbook or material will be made available from the supervisors.

Textbook or material will be made available from the supervisors.

Notes for reference

N/A

N/A

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.

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.

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

Coursework, presentation and/or report.

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

Examination

試験期間中には何も行わない

None during exam period

Details of examination

N/A

N/A

Other information

For any questions, contact your supervisor.

For any questions, contact your supervisor.

Reference URL

N/A

N/A

Office hours

Contact your supervisor.

Contact your supervisor.

Relations to attainment objectives of learning and education

（C）高度な知識を統合的に活用できる実践力・創造力

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

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

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

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

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

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

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

Key words

Energy, Environment

Energy, Environment

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

Subject name[English]	Advances in Material Science and Manufacturing[Advances in Material Science and Manufacturing]				
Schedule number	M41630340	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Fri.2～3	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～
Department Offered	Mechanical Engineering			**Beggining grade**	M2
Charge teacher name[Roman alphabet mark]	伊﨑　昌伸, 戸高　義一 IZAKI Masanobu, TODAKA Yoshikazu				
Numbering	MEC_MAS54025				

Objectives of class

Understand mechanical properties of structural materials, such as lattice defects, strength and fracture, from a microstructural perspective, and also chemical composition and heat treatment procedure of steels and non-ferrous materials including the mechanisms to control mechanical properties.

Understanding fundamental physics of solid materials, such as structure of atoms, electronic state of electron, bonding, symmetry of lattice, and scattering by electron, and the effects of the light and heat on the energy state and related physical properties, electrical and optical properties.

Contents of class

【face to face】[01st] Chap. 1 ~ 4: Introduction of materials science and engineering, Crystal structures in metals and alloys
【on-demand】[02nd] Chap. 4: Crystal structures in metals and alloys
【face to face】[03rd] Chap. 6: Imperfections in metals and alloys
【on-demand】[04th] Chap. 7: Diffusion in metals and alloys
【face to face】[05th] Chap. 8, 9: Mechanical properties, Strengthening mechanisms in metals and alloys
【on-demand】[06th] Chap. 9, 10: Strengthening mechanisms, Failure in metals and alloys
【face to face】[07th] Chap. 11, 12: Phase Diagrams, Phase transformations in metals and alloys

【face to face】[08th] Chap. 1 : Structure of atoms
【on-demand】[09th] Chap. 1: Electron and quantum number, orbital
【face to face】[10th] Chap. 2: Symmetry on Lattice
【on-demand】[11th] Chap. 2: Diffraction and Structural factor
【face to face】[12th] Chap. 2, Reciprocal space
【on-demand】[13th] Chap. 18: Electrical property and semiconductors
【face to face】[14th] Chap. 19: Optical property and optics

- - - - -
* If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for Preventing the Spread of Corona virus,
the course content and evaluation of achievement are subject to change.
- - - - -
* If there is any changes about a class schedule, I will inform you on Google Classroom or KYOMU JOHO SYSTEM.
- - - - -
【on-demand】: You can take the class whenever you want.
【face to face】: Regular face to face class.
- - - - -

Self Preparation and Review

Review every time after the lecture (90min), and prepare for next lecture (90min).

Related subjects

Textbook1	**Book title**	Materials Science and Engineering (9th Edition)			**ISBN**	978-1118319222
	Author	William D. Callister, Jr., David G. Rethwisch	**Publisher**	Wiley	**Publish year**	2014

Notes for textbook

It is desirable to purchase the textbook, but the textbook can also be lent, so please consult with the instructor.
The relating handouts will be given in the class.

It is desirable to purchase the textbook, but the textbook can also be lent, so please consult with the instructor.
The relating handouts will be given in the class.

Notes for reference

Goals to be achieved

(1) Understand the crystal structures and imperfections in metals and alloys.
(2) Understand the basics of mechanical properties and strengthening mechanisms of metals and alloys.
(3) Understand the failure in metals and alloys.
(4) Understand the phase diagrams and phase transformations in metals and alloys.

(1) Understand the electronic state of electron
(2) Understand the symmetry of lattice and scattering
(3) Understand the electrical and optical property of materials.

Evaluation of achievement

Evaluation means : Quiz and Report.
Evaluation basis : Students will be evaluated as follows.
S: Achieve all objectives and total marks of quiz and reports are 90 or higher (out of 100 points).
A: Achieve all objectives and total marks of quiz and reports are 80 or higher (out of 100 points).
B: Achieve 3 objectives and total marks of quiz and reports are 70 or higher (out of 100 points).
C: Achieve 3 objectives and total marks of quiz and reports are 60 or higher (out of 100 points).

Evaluation means : Quiz and Report.
Evaluation basis : Students will be evaluated as follows.
S: Achieve all objectives and total marks of quiz and reports are 90 or higher (out of 100 points).
A: Achieve all objectives and total marks of quiz and reports are 80 or higher (out of 100 points).
B: Achieve 2 objectives and total marks of quiz and reports are 70 or higher (out of 100 points).
C: Achieve 2 objectives and total marks of quiz and reports are 60 or higher (out of 100 points).

Examination
試験期間中には何も行わない
None during exam period

Details of examination
N/A

Other information
D-603, ext.6704, todaka@me.tut.ac.jp
D-505, ext.6694,m-izaki@me.tut.ac.jp

Reference URL
http://martens.me.tut.ac.jp/
http://tf,metut,.ac.jp

Office hours
Please send e-mail in advance for appointment.
Please send e-mail in advance for appointment.

Relations to attainment objectives of learning and education

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

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

Key words
metal / alloy, crystal structure, microstructure, lattice defect, strengthening mechanism, phase transformation, electron, quantum number, semiconductor, optics

(M41630430)Microstructure and Properties of Structural Materials[Microstructure and Properties of Structural Materials]

Subject name[English]	Microstructure and Properties of Structural Materials[Microstructure and Properties of Structural Materials]				
Schedule number	M41630430	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Spring1 term	**Day of the week,period**	Fri.3～3	**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]	戸高　義一 TODAKA Yoshikazu				
Numbering	MEC_MAS54025				

Objectives of class

Understand mechanical properties of structural materials, such as lattice defects, strength and fracture, from a microstructural perspective, and also chemical composition and heat treatment procedure of steels and non-ferrous materials including the mechanisms to control mechanical properties.

Contents of class

【face to face】[01st] Chap. 1 ~ 4: Introduction of materials science and engineering, Crystal structures in metals and alloys
【on-demand】[02nd] Chap. 4: Crystal structures in metals and alloys
【face to face】[03rd] Chap. 6: Imperfections in metals and alloys
【on-demand】[04th] Chap. 7: Diffusion in metals and alloys
【face to face】[05th] Chap. 8, 9: Mechanical properties, Strengthening mechanisms in metals and alloys
【on-demand】[06th] Chap. 9, 10: Strengthening mechanisms, Failure in metals and alloys
【face to face】[07th] Chap. 11, 12: Phase Diagrams, Phase transformations in metals and alloys

- - - - -
* If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for Preventing the Spread of Corona virus,
the course content and evaluation of achievement are subject to change.
- - - - -
* If there is any changes about a class schedule, I will inform you on Google Classroom or KYOMU JOHO SYSTEM.
- - - - -
【on-demand】: You can take the class whenever you want.
【face to face】: Regular face to face class.
- - - - -

Self Preparation and Review

Review every time after the lecture (90min), and prepare for next lecture (90min).

Related subjects

N/A

Textbook1	**Book title**	Materials Science and Engineering (9th Edition)			**ISBN**	978-1118319222
	Author	William D. Callister, Jr., David G. Rethwisch	**Publisher**	Wiley	**Publish year**	2014

Notes for textbook

It is desirable to purchase the textbook, but the textbook can also be lent, so please consult with the instructor.
The relating handouts will be given in the class.

Notes for reference

N/A

Goals to be achieved

(1) Understand the crystal structures and imperfections in metals and alloys.
(2) Understand the basics of mechanical properties and strengthening mechanisms of metals and alloys.
(3) Understand the failure in metals and alloys.
(4) Understand the phase diagrams and phase transformations in metals and alloys.

Evaluation of achievement

Evaluation means : Quiz and Report.
Evaluation basis : Students will be evaluated as follows.
S: Achieve all objectives and total marks of quiz and reports are 90 or higher (out of 100 points).
A: Achieve all objectives and total marks of quiz and reports are 80 or higher (out of 100 points).
B: Achieve 3 objectives and total marks of quiz and reports are 70 or higher (out of 100 points).
C: Achieve 3 objectives and total marks of quiz and reports are 60 or higher (out of 100 points).

Examination

試験期間中には何も行わない
None during exam period

Details of examination

N/A

Other information

D-603, ext.6704, todaka@me.tut.ac.jp

Reference URL

http://martens.me.tut.ac.jp/

Office hours

Please send e-mail in advance for appointment.

Relations to attainment objectives of learning and education

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

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

Key words

metal / alloy, crystal structure, microstructure, lattice defect, strengthening mechanism, phase transformation

(M41630440)Precision Mechatronics[Precision Mechatronics]

Subject name[English]	Precision Mechatronics[Precision Mechatronics]				
Schedule number	M41630440	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Spring1 term	**Day of the week,period**	Thu.2～2	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Mechanical Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	佐藤　海二 SATO Kaiji				
Numbering	MEC_MAS55025				

Objectives of class

本講義を履修することによって，以下の能力を修得する.

1）精密／超精密運動のための機構の基礎知識を身につけ，その精度劣化要因を理解できる.

2）精密／超精密運動のためのセンサの基本原理や制御方法の性質を理解し，適切に選択する ことができる.

Students will acquire the following skills by taking this course.
1) Learn basic knowledge of machines for precision and ultra-precision motions, and gain an understanding of precision deterioration factors.
2) Gain an understanding of basic principles of sensors and properties of control methods for precision and ultra-precision motions, and be able to choose appropriately.

Contents of class

[予定]
（対面）　　第 1 週（回）. . .　精密機械基礎
（オンデマンド）第 2 週（回）. . .　精密・超精密機構の構成と特性（動作範囲が狭い機構）
（対面）　　第 3 週（回）. . .　精密・超精密機構の構成と特性（動作範囲が広い機構）
（オンデマンド）第 4 週（回）. . .　精密・超精密機械システムのための測定技術
（対面）　　第 5 週（回）. . .　精密・超精密機械システムのための制御技術
（オンデマンド）第 6 週（回）. . .　事例＜1＞ 露光装置　－ 役割と性能・構成の変遷　－
（オンデマンド）第 7 週（回）. . .　事例＜2＞ 三次元測定機　－ 役割と特徴　－

授業実施形態が変更になる場合は、GoogleClassroom や教務情報
システムより通知する。

[Plans]
(face to face) 1st week/time ... Introduction
(on-demand) 2nd week/time ... Design of precision/ultra-precision mechanisms with a short working range
(face to face) 3rd week/time ... Design of precision/ultra-precision mechanisms with a long working range
(on-demand) 4th week/time ... Measurement techniques for precision/ultra-precision motion systems
(face to face) 5th week/time ... Control techniques for precision/ultra-precision motion systems
(on-demand) 6th week/time ... Case study Exposure tools - Aim and transition of performance and configuration
(on-demand) 7th week/time ... Case study Coordinate measuring machine - Aim and features

If there is any changes about a class schedule, I will inform you on
Google Classroom or KYOMU JOHO SYSTEM.

Self Preparation and Review

毎回の講義内容を復習するとともに，次回の内容についてテキスト等を参考に予習してくること.（90 分）
本講義に関連する書籍，文献，展示会を，自分で調べ情報の収集と理解に努めること.（90 分）
Students are required to prepare for and review each lecture contents based on handouts provided.
Students are required to make an effort to collect and understand the information and the knowledge from texts, literature and exhibitions regarding this lecture themselves.
To prepare for and review the lecture for around 90 minutes each.

Related subjects

メカトロニクス，制御工学. 計測工学，機械設計，機械要素

Mechatronics Control Engineering, Measurement and Instrumentation, Machine Design, Mechanical Elements

Notes for textbook

教科書：特定の教科書は使用しない．講義資料を用意するので，各自講義に持参すること．

No textbook is required for this class.

Reference1	**Book title**	Precision machine design			**ISBN**	0-13-690918-3
	Author	Alexander H. Slocum	**Publisher**	Prentice Hall	**Publish year**	1992
Reference2	**Book title**	Foundations of Ultraprecision Mechanism Design			**ISBN**	2-88449-001-9
	Author	S.T.Smith, D.G. Chetwynd	**Publisher**	Gorden and Breach Science Publishers	**Publish year**	1992
Reference3	**Book title**	ナノテクノロジーと超精密位置決め技術			**ISBN**	4-7693-2175-9
	Author	大塚二郎著	**Publisher**	工業調査会	**Publish year**	2005

Notes for reference

N/A

Goals to be achieved

1）精密メカトロニクスの基礎を理解し，簡単な議論ができる．
2）精密メカトロニクスの機構やアクチュエータの基本的な特徴と動作範囲による選択の違いを理解し，説明できる．
3）精密メカトロニクスのセンサの基本的な特徴を理解し，利用できる．
4）精密メカトロニクスの制御における課題を理解できる．

1) To understand the basics of precision mechatronic systems and have a brief discussion.
2) To understand and explain the basic features of mechanisms and actuators in precision mechatronic systems and the differences in selection depending on the working range.
3) To understand and use the basic features of sensors for precision mechatronic systems.
4) To understand control issues in precision mechatronic systems.

Evaluation of achievement

評価方法：毎回の演習・小テスト（50%），レポート（50%）で評価する．

The final grade will be determined by quizzes during lecture 50% and report 50%, comprehensively.

Examination

レポートで実施

By Report

Details of examination

N/A

Other information

Kaiji Sato, Room:D-408, E-mail:sato@me.tut.ac.jp

Reference URL

N/A

Office hours

事前にメールで確認

Need an appointment by e-mail

Relations to attainment objectives of learning and education

Key words

運動誤差，精密機構，超精密機構，機構設計，案内，軸受，動力伝達要素，アクチュエータ，計測，センサ，制御，超精密加工機，露光装置，三次元測定機

Motion error, precision mechanism, ultra-precision mechanism, mechanism design, guide, bearing, power transmission, actuator, measurement, sensor, control, ultra-precision machine tool, exposure tool, coordinate measuring machine

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

Subject name[English]	Advances in Systems, Control and Robotics[Advances in Systems, Control and Robotics]				
Schedule number	M41630460	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Spring1 term	**Day of the week,period**	Thu.2～2,Fri.2～2	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～
Department Offered	Mechanical Engineering			**Beggining grade**	M2
Charge teacher name[Roman alphabet mark]	佐藤　海二, 内山　直樹 SATO Kaiji, UCHIYAMA Naoki				
Numbering	MEC_MAS55025				

Objectives of class

Students will acquire the following skills by taking this course.
1) Learn basic knowledge of machines for precision and ultra-precision motions, and gain an understanding of precision deterioration factors.
2) Gain an understanding of basic principles of sensors and properties of control methods for precision and ultra-precision motions, and be able to choose appropriately.
3) Learn typical mathematical programming approaches that optimize objective functions under constraints.

Contents of class

[Plans]
Lectures provided by Prof. Sato:
(face to face) 1st week/time ... Introduction
(on-demand) 2nd week/time ... Design of precision/ultra-precision mechanisms with a short working range
(face to face) 3rd week/time ... Design of precision/ultra-precision mechanisms with a long working range
(on-demand) 4th week/time ... Measurement techniques for precision/ultra-precision motion systems
(face to face) 5th week/time ... Control techniques for precision/ultra-precision motion systems
(on-demand) 6th week/time ... Case study Exposure tools – Aim and transition of performance and configuration
(on-demand) 7th week/time ... Case study Coordinate measuring machine – Aim and features

Lectures provided by Prof. Uchiyama:
(face to face) 1st week: Fundamentals of mathematical programming I
(on-demand) 2nd week: Fundamentals of mathematical programming II
(face to face) 3rd week: Algorithm of linear programming I
(on-demand) 4th week: Algorithm of linear programming II
(face to face) 5th week: Fundamentals of nonlinear programming
(on-demand) 6th week: Algorithm of nonlinear programming
(face to face) 7th week: Summary (including the end-term examination)

If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for Preventing the Spread of Corona virus, the course content and evaluation of achievement are subject to change.

If there is any changes about a class schedule, I will inform you on Google Classroom or KYOMU JOHO SYSTEM.

Self Preparation and Review

Students are required to prepare for and review each lecture contents based on handouts provided.
Students are required to make an effort to collect and understand the information and the knowledge from texts, literature and exhibitions regarding this lecture themselves.
To enhance a learning effect, students are encouraged to refer to distributed handouts.
Expected time to prepare for and review the lecture is around 90 minutes each.

Related subjects

Mechatronics Control Engineering, Measurement and Instrumentation, Machine Design, Mechanical Elements, Calculus, Linear algebra

Notes for textbook

No textbook is required for this class.

Reference1	**Book title**	Precision machine design			**ISBN**	0-13-690918-3
	Author	Alexander H. Slocum	**Publisher**	Prentice Hall	**Publish year**	1992
Reference2	**Book title**	Foundations of ultraprecision mechanism design			**ISBN**	2-88449-001-9
	Author	S.T. Smith and D.G. Chetwynd	**Publisher**	Gordon and Breach Science Publishers	**Publish year**	1992

Notes for reference

N/A

Goals to be achieved

1) To understand the basics of precision mechatronic systems and have a brief discussion.
2) To understand and explain the basic features of mechanisms and actuators in precision mechatronic systems and the differences in selection depending on the working range.
3) To understand and use the basic features of sensors for precision mechatronic systems.
4) To understand control issues in precision mechatronic systems.
5) Expected to understand fundamentals of mathematical programming
6) Expected to understand fundamentals of linear programming
7) Expected to understand fundamentals of nonlinear programming

Evaluation of achievement

Lectures provided by Prof. Sato
The final grade will be determined by quizzes during lecture 50% and report 50%, comprehensively.

Lectures provided by Prof. Uchiyama
The grade will be determined by reports (30%) and the end-of term examination score (70 %).

Final grade will be the average of the above two grades.

The credit of this course is given if the score of the above examination is 60% or over.
Grade levels are C (60% – less than 70%), B (70 – less than 80%), A (80 – less than 90%) and S (90% or over).

Examination

その他
Other

Details of examination

N/A

Other information

Naoki Uchiyama, Room:D-406, E-mail:uchiyama@tut.jp
Kajji Sato, Room:D-408, E-mail:sato@me.tut.ac.jp

Reference URL

N/A

Office hours

Need an appointment by e-mail

Relations to attainment objectives of learning and education

Key words

Motion error, precision mechanism, ultra-precision mechanism, mechanism design, guide, bearing, power transmission, actuator, measurement, sensor, control, ultra-precision machine tool, exposure tool, coordinate measuring machine, mathematical programming, linear programming, nonlinear programming

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

Subject name[English]	Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]				
Schedule number	M42610020	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Required
Time of starting a course	2Years	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	M1, M2
Charge teacher name[Roman alphabet mark]	S2系教務委員, 2系各教員 2kei kyomu Iin-S, 2kei 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

N/A

Related subjects

N/A

Notes for textbook

Reference and material will be available from the supervisor.

Notes for reference

N/A

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.
Grades: S: 90-100, A:80-89, B:70-79, C:60-69

Examination

試験期間中には何も行わない
None during exam period

Details of examination

N/A

Other information

N/A

Reference URL

N/A

Office hours

N/A

Relations to attainment objectives of learning and education

(B)技術者・研究者としての正しい倫理観と社会性
上級技術者・研究者として社会的・倫理的責任を有し，社会における技術的課題を設定・解決・評価する能力を身につけている。
(C)高度な知識を統合的に活用できる実践力・創造力
電気・電子情報工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。

（D）グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
（E）最新の技術や社会環境の変化に対する探究心と持続的学習力
社会，環境，技術等の変化に対応して，生涯にわたって自発的に計画し学習する能力を身につけている。
(B) Sound ethics and social awareness as advanced-level engineers and researchers
Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technical issues in society
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about electrical and electronic information engineering as well as related fields; to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about electrical and electronic information engineering as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high-level skills to mutually respect the values of individual team members; to contribute to the team's achievements through working cooperatively with other members
(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

(B) Sound ethics and social awareness as advanced-level engineers and researchers
Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technicalissues in society
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills toutilize such knowledge for problem solving in an integrated manner
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members
(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

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**	M1
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

N/A

Related subjects

N/A

Notes for textbook

Reference and material will be available from the supervisor.

Notes for reference

N/A

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.
Grades: S: 90-100, A:80-89, B:70-79, C:60-69

Examination

試験期間中には何も行わない
None during exam period

Details of examination

N/A

Other information

N/A

Reference URL

N/A

Office hours

N/A

Relations to attainment objectives of learning and education

電気・電子情報工学専攻
(B)技術者・研究者としての正しい倫理観と社会性
上級技術者・研究者として社会的・倫理的責任を有し，社会における技術的課題を設定・解決・評価する能力を身につけている。
(C)高度な知識を統合的に活用できる実践力・創造力
電気・電子情報工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践

的・創造的能力を身につけている。
(C1) 電気・電子情報工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。
(C2) 電気・電子情報工学およびその関連分野の広範囲の知識の連携により，研究開発に対する方法論を体得して，研究開発の計画を立案および実践し，課題解決のための新たな技術を創造できる能力を身につけている。
(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
(D1) 論文，口頭及び情報メディアを通じて，自分の論点や考えなどを国の内外において効果的に表現・発信し，コミュニケーションする能力を身につけている。
(D2) チーム内の個々の要員の価値観を互いに尊重するとともに，協調して，チームとしての目標達成に寄与できる高い能力を身につけている。
(E)最新の技術や社会環境の変化に対する探究心と持続的学習力
社会，環境，技術等の変化に対応して，生涯にわたって自発的に計画し学習する能力を身につけている。
(B) Sound ethics and social awareness as advanced-level engineers and researchers
Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technical issues in society
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about electrical and electronic information engineering as well as related fields; to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about electrical and electronic information engineering as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high-level skills to mutually respect the values of individual team members; to contribute to the team's achievements through working cooperatively with other members
(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

Graduate Program of Electrical and Electronic Information Engineering for Master's Degree
(B) Sound ethics and social awareness as advanced-level engineers and researchers
Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technicalissues in society
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills toutilize such knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about electrical and electronic information engineering as well as related fields; to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about electrical and electronic information engineering as well as related fields; to make plans for researchand development and put them into practice; and to create new technologies to solve problems
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high-level skills to mutually respect the values of individual team members; to contribute to the team's achievements through working cooperatively with other members
(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

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_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

N/A

Related subjects

N/A

Notes for textbook

Reference and material will be available from the supervisor.

Notes for reference

N/A

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.
Grades: S: 90-100, A:80-89, B:70-79, C:60-69

Examination

試験期間中には何も行わない
None during exam period

Details of examination

N/A

Other information

N/A

Reference URL

N/AA

Office hours

N/A

Relations to attainment objectives of learning and education

電気・電子情報工学専攻
(B)技術者・研究者としての正しい倫理観と社会性
上級技術者・研究者として社会的・倫理的責任を有し，社会における技術的課題を設定・解決・評価する能力を身につけている。
(C)高度な知識を統合的に活用できる実践力・創造力
電気・電子情報工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。

(C1) 電気・電子情報工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。
(C2) 電気・電子情報工学およびその関連分野の広範囲の知識の連携により，研究開発に対する方法論を体得して，研究開発の計画を立案および実践し，課題解決のための新たな技術を創造できる能力を身につけている。
(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
(D1) 論文，口頭及び情報メディアを通じて，自分の論点や考えなどを国の内外において効果的に表現・発信し，コミュニケーションする能力を身につけている。
(D2) チーム内の個々の要員の価値観を互いに尊重するとともに，協調して，チームとしての目標達成に寄与できる高い能力を身につけている。
(E)最新の技術や社会環境の変化に対する探究心と持続的学習力
社会，環境，技術等の変化に対応して，生涯にわたって自発的に計画し学習する能力を身につけている。
(B) Sound ethics and social awareness as advanced-level engineers and researchers
Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technical issues in society
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about electrical and electronic information engineering as well as related fields; to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about electrical and electronic information engineering as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high-level skills to mutually respect the values of individual team members; to contribute to the team's achievements through working cooperatively with other members
(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

Graduate Program of Electrical and Electronic Information Engineering for Master's Degree
(B) Sound ethics and social awareness as advanced-level engineers and researchers
Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technicalissues in society
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(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

Key words

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

Subject name[English]	Seminar on Electrical and Electronic Information Engineering[Seminar on Electrical and Electronic Information Engineering]				
Schedule number	M42610040	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	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

N/A

Related subjects

N/A

Notes for textbook

Textbook or material will be made available from the supervisor. To be announced by individual supervisors.

Notes for reference

N/A

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.
Grades: S: 90-100, A:80-89, B:70-79, C:60-69

Examination

試験期間中には何も行わない
None during exam period

Details of examination

N/A

Other information

N/A

Reference URL

N/A

Office hours

N/A

Relations to attainment objectives of learning and education

電気・電子情報工学専攻
(B)技術者・研究者としての正しい倫理観と社会性
上級技術者・研究者として社会的・倫理的責任を有し，社会における技術的課題を設定・解決・評価する能力を身につけている。
(C)高度な知識を統合的に活用できる実践力・創造力

電気・電子情報工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。
(C1) 電気・電子情報工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。
(C2) 電気・電子情報工学およびその関連分野の広範囲の知識の連携により，研究開発に対する方法論を体得して，研究開発の計画を立案および実践し，課題解決のための新たな技術を創造できる能力を身につけている。
(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
(D1) 論文，口頭及び情報メディアを通じて，自分の論点や考えなどを国の内外において効果的に表現・発信し，コミュニケーションする能力を身につけている。
(D2) チーム内の個々の要員の価値観を互いに尊重するとともに，協調して，チームとしての目標達成に寄与できる高い能力を身につけている。
(E)最新の技術や社会環境の変化に対する探究心と持続的学習力
社会，環境，技術等の変化に対応して，生涯にわたって自発的に計画し学習する能力を身につけている。
(B) Sound ethics and social awareness as advanced-level engineers and researchers
Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technical issues in society
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about electrical and electronic information engineering as well as related fields; to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about electrical and electronic information engineering as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high-level skills to mutually respect the values of individual team members; to contribute to the team's achievements through working cooperatively with other members
(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

Graduate Program of Electrical and Electronic Information Engineering for Master's Degree
(B) Sound ethics and social awareness as advanced-level engineers and researchers
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(D2) Have high-level skills to mutually respect the values of individual team members; to contribute to the team's achievements through working cooperatively with other members
(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

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

N/A

Related subjects

N/A

Notes for textbook

Textbook or material will be made available from the supervisor. To be announced by individual supervisors.

Notes for reference

N/A

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.
Grades: S: 90-100, A:80-89, B:70-79, C:60-69

Examination

試験期間中には何も行わない
None during exam period

Details of examination

N/A

Other information

N/A

Reference URL

N/A

Office hours

N/A

Relations to attainment objectives of learning and education

電気・電子情報工学専攻
(B)技術者・研究者としての正しい倫理観と社会性
上級技術者・研究者として社会的・倫理的責任を有し，社会における技術的課題を設定・解決・評価する能力を身につけている。
(C)高度な知識を統合的に活用できる実践力・創造力
電気・電子情報工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。

(C1) 電気・電子情報工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。
(C2) 電気・電子情報工学およびその関連分野の広範囲の知識の連携により，研究開発に対する方法論を体得して，研究開発の計画を立案および実践し，課題解決のための新たな技術を創造できる能力を身につけている。
(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
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(D2) チーム内の個々の要員の価値観を互いに尊重するとともに，協調して，チームとしての目標達成に寄与できる高い能力を身につけている。
(E)最新の技術や社会環境の変化に対する探究心と持続的学習力
社会，環境，技術等の変化に対応して，生涯にわたって自発的に計画し学習する能力を身につけている。
(B) Sound ethics and social awareness as advanced-level engineers and researchers
Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technical issues in society
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner
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Have the communication skills to effectively express one's own ideas and results while working on issues faced by a globally changing society in cooperation with other team members
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(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

Graduate Program of Electrical and Electronic Information Engineering for Master's Degree
(B) Sound ethics and social awareness as advanced-level engineers and researchers
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(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

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**	M2
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

N/A

Related subjects

N/A

Notes for textbook

Textbook or material will be made available from the supervisor. To be announced by individual supervisors.

Notes for reference

N/A

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.
Grades: S: 90-100, A:80-89, B:70-79, C:60-69

Examination

試験期間中には何も行わない
None during exam period

Details of examination

N/A

Other information

N/A

Reference URL

N/A

Office hours

N/A

Relations to attainment objectives of learning and education

電気・電子情報工学専攻
(B)技術者・研究者としての正しい倫理観と社会性
上級技術者・研究者として社会的・倫理的責任を有し，社会における技術的課題を設定・解決・評価する能力を身につけている。
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電気・電子情報工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践

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Graduate Program of Electrical and Electronic Information Engineering for Master's Degree
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(E) Inquisitive mind and continuous learning ability for changes in the state-of-the-art technology and in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

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

Review each lecture and prepare for the next class with reference to the textbook.

Related subjects

特になし
N/A

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

N/A

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.
Grades: S: 90-100, A:80-89, B:70-79, C:60-69.

Examination

試験期間中には何も行わない
None during exam period

Details of examination

N/A

Other information

N/A

Reference URL

N/A

Office hours

N/A

Relations to attainment objectives of learning and education

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

電気・電子情報工学専攻
（C）高度な知識を統合的に活用できる実践力・創造力
電気・電子情報工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。
（C1）電気・電子情報工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。
（C2）電気・電子情報工学およびその関連分野の広範囲の知識の連携により，研究開発に対する方法論を体得して，研究開発の計画を立案および実践し，課題解決のための新たな技術を創造できる能力を身につけている。
Graduate Program of Electrical and Electronic Information Engineering for Master's Degree
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills toutilize such knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about electrical and electronic information engineering as well as related fields; to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about electrical and electronic information engineering as well as related fields; to make plans for researchand development and put them into practice; and to create new technologies to solve problems

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(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
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(C1) Have the skills to voluntarily acquire theories and applied knowledge about electrical and electronic information engineering as well as related fields; to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about electrical and electronic information engineering as well as related fields; to make plans for researchand development and put them into practice; and to create new technologies to solve problems

Key words

(M42630140)Physics for Electronics 1[Physics for Electronics 1]

Subject name[English]	Physics for Electronics 1[Physics for Electronics 1]				
Schedule number	M42630140	**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, 加藤 亮 MATSUDA Atsunori, HATTORI Toshiaki, KATOH Ryo				
Numbering	ELC_MAS52025				

Objectives of class

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

Contents of class

"Physics for Electronics 1" is composed of three topics of functional materials, electrodics, and ion recognition reagents based on chemical analysis, which will be delivered for four or five times for each by three professors whose expertise lie on the individual categories.

The category of "functional materials" is made to learn preparation, characterization and applications of functional materials for electronics 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 "ion recognition reagents" is devoted to the understanding of (1) Fundamentals of chemical analyses, (2) Development of anion recognition reagent by using hydrogen bonding, and (3) Development of moisture sensing in oil with chemical sensor.

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 three categories (33.4%); functional materials, electrodics, and ion recognition reagents based on chemical analysis.

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

Ion recognition reagents based on chemical analysis: ryo_kato@crfc.tut.ac.jp

If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for Preventing the Spread of Corona virus, the course content and evaluation of achievement are subject to change.

Classes will be given by on-demand(You can take the class whenever you want.) and/or face to face (Regular face to face class).

Reference URL

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

Office hours

one hour after every classes

Relations to attainment objectives of learning and education

(C) The basic skills and applicability necessary to scientifically make technological advances Utilizing the ability realized from the acquisition of a basic knowledge in science and technology; the mastery of subjects in mathematics, natural science, information technology, MOT, global environmental technology, and intellectual property.

Key words

functional materials, photonics, electrodisc, ion recognition reagent, chemical analysis

(M42630180)Electrical Technology and Materials 1[Electrical Technology and Materials 1]

Subject name[English]	Electrical Technology and Materials 1[Electrical Technology and Materials 1]				
Schedule number	M42630180	**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]	稲田　亮史, 村上　義信, 針谷　達 INADA Ryoji, MURAKAMI Yoshinobu, HARIGAI Toru				
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 subcourses 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 subcourses to choose from.

Contents of class

Subcourse 1 (T. Harigai)
1. Introduction of carbon nanomaterials and their relationship to electrical engineering (1 weeks)
2. Mechanical property of carbon nanomaterials (1 weeks)
3. Electrical property of carbon nanomaterials (1 weeks)
4. Application of carbon nanomaterials to energy devices (1 weeks)
5. Application of carbon nanomaterials to power electronics (1 weeks)

Subcourse 2 (5 weeks, R. Inada)
1. Introduction of Electrochemical Energy Conversion Devices (1 week)
2. Fundamentals of Electrochemical Energy Conversion Devices (1 week)
3. Lithium-Ion Secondary Batteries (1) (1 week)
4. Lithium-Ion Secondary Batteries (2) (1 week)
5. Recent Trend in Electrochemical Energy Storage Devices (1 week)

Subcourse 3 (Y. Murakami)
1. Introduction of Electric Energy Systems (1 week)
2. High Voltage Engineering and Electrical Insulation (2 weeks)
3. Fundamental Properties of Dielectrics and Electrical Insulating Materials(2 weeks)

Last week: Final examination

If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for
Preventing the Spread of Corona virus, the course content and evaluation of achievement are subject to change.

Subcourse 1 (T. Harigai)
1. Introduction of carbon nanomaterials and their relationship to electrical engineering (1 weeks)
2. Mechanical property of carbon nanomaterials (1 weeks)
3. Electrical property of carbon nanomaterials (1 weeks)
4. Application of carbon nanomaterials to energy devices (1 weeks)
5. Application of carbon nanomaterials to power electronics (1 weeks)

Subcourse 2 (5 weeks, R. Inada)
1. Introduction of Electrochemical Energy Conversion Devices (1 week)
2. Fundamentals of Electrochemical Energy Conversion Devices (1 week)
3. Lithium-Ion Secondary Batteries (1) (1 week)

4. Lithium-Ion Secondary Batteries (2) (1 week)
5. Recent Trend in Electrochemical Energy Storage Devices (1 week)

Subcourse 3 (Y. Murakami)
1. Introduction of Electric Energy Systems (1 week)
2. High Voltage Engineering and Electrical Insulation (2 weeks)
3. Fundamental Properties of Dielectrics and Electrical Insulating Materials(2 weeks)

Last week: Final examination

If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for
Preventing the Spread of Corona virus, the course content and evaluation of achievement are subject to change.

Self Preparation and Review

Materials to be used in the lecture will be distributed from the lecturer before starting each subcourse. The lecturers will give a lecture on the premise that all the students have prepared this material before the lecture begins. It may not be possible to attend a lecture if you do not prepare materials.
Materials to be used in the lecture will be distributed from the lecturer before starting each subcourse. The lecturers will give a lecture on the premise that all the students have prepared this material before the lecture begins. It may not be possible to attend a lecture if you do not prepare materials.

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.

Reference1	**Book title**	Fuel Cell Systems Explained			**ISBN**	
	Author	J. Larminie and A. Dicks	**Publisher**	Wiley	**Publish year**	
Reference2	**Book title**	Lithium Ion Batteries: Science and Technologies			**ISBN**	
	Author	M. Yoshio, R.J. Brodd and A. Kozawa	**Publisher**	Springer-Verlag	**Publish year**	
Reference3	**Book title**	High Voltage Engineering			**ISBN**	
	Author	E. Kuffel, W. Zaengel and J. Kuffel	**Publisher**	Newnes	**Publish year**	

Notes for reference

特になし
N/A

Goals to be achieved

1. Understand the basics and recent trend for carbon materials and their application.
2. Understand the basics and recent trend for rechargeable batteries.
3. Understand the basics and recent trend for insulation materials and its application.
1. Understand the basics and recent trend for carbon materials and their application.
2. Understand the basics and recent trend for rechargeable batteries.
3. Understand the basics and recent trend for insulation materials and its application.

Evaluation of achievement

In final exams we will ask questions on the contents of all subcourses. We evaluate the results only based on the final exam scores. The result is evaluated in the following five stages.
S: If the score of the final exam is 90 points or more
A: If the score of the final exam is 80 points or more
B: If the score of the final exam is 70 points or more
C: If the score of the final exam is 60 points or more
D: If the score of the final exam is less than 60 points

In final exams we will ask questions on the contents of all subcourses. We evaluate the results only based on the final exam scores. The result is evaluated in the following five stages.
S: If the score of the final exam is 90 points or more
A: If the score of the final exam is 80 points or more
B: If the score of the final exam is 70 points or more

C: If the score of the final exam is 60 points or more
D: If the score of the final exam is less than 60 points

Examination

定期試験を実施（対面）
Examination(Face to Face)

Details of examination

In order to obtain good results in final exams, we will also conduct a small test at any time while each subcourse is offered. Therefore, it is desirable to prepare lecture materials beforehand and attend all the lectures.
In order to obtain good results in final exams, we will also conduct a small test at any time while each subcourse is offered. Therefore, it is desirable to prepare lecture materials beforehand and attend all the lectures.

Other information

特になし
N/A

Reference URL

特になし
N/A

Office hours

We do not have an office hour, so contact first by e-mail.
We do not have an office hour, so contact first by e-mail.

Relations to attainment objectives of learning and education

Key words

(M42630220)LSI Process 1[LSI Process 1]

Subject name[English]	LSI Process 1[LSI Process 1]				
Schedule number	M42630220	**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, 野田　俊彦 SAWADA Kazuaki, ISHIKAWA Yasuhiko, SEKIGUCHI Hiroto, NODA Toshihiko				
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.

Contents of class
Integrated circuits
Device processing
MEMS/NEMS
Latest MOS FETs
Current topics in IC/MEMS

Self Preparation and Review
Review each lecture and prepare for the next class with reference to the textbook.

Related subjects
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

Notes for reference
N/A

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.

Evaluation of achievement
routine exeam(100%)

Examination
その他
Other

Details of examination
N/A

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
T. Noda (C-611)
noda-t@eiiris.tut.ac.jp

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)

Office hours

book an apopintment by e-mail, phone, etc.

Relations to attainment objectives of learning and education

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

Graduate Program of Electrical and Electronic Information Engineering for Master's Degree
(C1) Have the skills to voluntarily acquire theories and applied knowledge about electrical and electronic information engineering as well as related fields; to utilize such knowledge in an integrated manner

Key words

(M42630240)Information and Communication Technology 1[Information and Communication Technology 1]

Subject name[English]	Information and Communication Technology 1[Information and Communication Technology 1]				
Schedule number	M42630240	**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]	上原 秀幸, 竹内 啓悟 UEHARA Hideyuki, TAKEUCHI Keigo				
Numbering	ELC_MAS55025				

Objectives of class

Students select one course from the following two courses:
A first 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 other 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. Uehara:
1. Medium access control protocols
2. Multi-hop communications
3. Ad hoc and sensor networks

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

If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for
Preventing the Spread of Corona virus, the course content and evaluation of achievement are subject to change.
If there is any changes about a class schedule, I will inform you on Google Classroom or KYOMU JOHO SYSTEM.

Self Preparation and Review

Review each lecture and prepare for the next class with reference to the handouts.

Related subjects

Students who register for this lecture must pass an interview by the professors to check that they satisfy the prerequisites below:

Prerequisite of Course 1:
Sufficient knowledge about the following; wireless digital modulation and demodulation, radio propagation characteristic, signal processing, probability, random variables and stochastic process.

Prerequisite of Course 2:
Deep understanding on modulation/demodulation, signal processing, probability theory, and information theory is prerequisite. In particular, sufficient knowledge about probability theory is required.

Notes for textbook

Instruct in 1st class.

Notes for reference

N/A

Goals to be achieved

Course 1:
- 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 2:
- 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 reports and presentations.

Course 2: Marks are based on reports and tests.

Examination

定期試験を実施(対面)
Examination(Face to Face)

Details of examination

N/A

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

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

Graduate Program of Electrical and Electronic Information Engineering for Master's Degree
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills toutilize such knowledge for problem solving in an integrated manner

Key words

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 3kei kyomu Iin-S				
Numbering	CMP_MAS51015				

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 account 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

（C）高度な知識を統合的に活用できる実践力・創造力
情報・知能工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。
(C1) 情報・知能工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。
(C2) 情報・知能工学およびその関連分野の広範囲の知識の連携により，研究開発に対する方法論を体得して，研究開発の計画を立案および実践し，課題解決のための新たな技術を創造できる能力を身につけている。
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about computer science and engineering as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about computer science and engineering as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about computer science and engineering as well as related fields; and have the practical and creative skills to utilize suchknowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about computer science and engineering as well as related fields; to make plans for research and developmentand put them into practice; and to create new technologies to solve problems

Key words

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

Subject name[English]	Seminar on Computer Science and Engineering II[Seminar on Computer Science and Engineering II]				
Schedule number	M43610020	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～
Department Offered	Computer Science and Engineering			**Beggining grade**	M2
Charge teacher name[Roman alphabet mark]	S3系教務委員 3kei kyomu Iin-S				
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

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

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

Examination

試験期間中には何も行わない

None during exam period

Details of examination

試験期間中には何も行わない

Non during exam period

Other information

指導教員に問い合わせること。

Consult with your advisor.

Reference URL

Office hours

指導教員に問い合わせること。

Consult with your advisor.

Relations to attainment objectives of learning and education

(C)高度な知識を統合的に活用できる実践力・創造力
情報・知能工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。
(C1) 情報・知能工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。
(C2) 情報・知能工学およびその関連分野の広範囲の知識の連携により，研究開発に対する方法論を体得して，研究開発の計画を立案および実践し，課題解決のための新たな技術を創造できる能力を身につけている。
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about computer science and engineering as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about computer science and engineering as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about computer science and engineering as well as related fields; and have the practical and creative skills to utilize suchknowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about computer science and engineering as well as related fields; to make plans for research and developmentand put them into practice; and to create new technologies to solve problems

Key words

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

Subject name[English]	Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering]				
Schedule number	M43610030	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Required
Time of starting a course	2Years	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Computer Science and Engineering			**Beggining grade**	M1, M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, 3系各教員 3kei kyomu Iin-S, 3kei kakukyouin				
Numbering	CMP_MAS61015				

Objectives of class

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

Contents of class

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

Self Preparation and Review

Consult with your advisor for them.

Related subjects

Consult with your advisor for them.

Notes for textbook

Consult with your advisor for them.

Notes for reference

Goals to be achieved

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

Evaluation of achievement

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

[Evaluation basis] Students who attend this class will be evaluated as follows:
S: Achieved the high level of "master degree", 90 or higher (out of 100 points).
A: Left something to be desired, 80 or higher (out of 100 points).
B: Left something to be desired, 70 or higher (out of 100 points).
C: Left much to be desired, 60 or higher (out of 100 points).

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours
Relations to attainment objectives of learning and education (D) Communication skills for global success Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members (D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media (D2) Have high-level skills to mutually respect the values of individual team members; and to contribute to the team's achievements through working cooperatively with other team members
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, M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, 3系各教員 3kei kyomu Iin-S, 3kei kakukyouin				
Numbering	CMP_MAS61015				

Objectives of class

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

Contents of class

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

Self Preparation and Review

Consult with your advisor for them.

Related subjects

Consult with your advisor for them.

Notes for textbook

Consult with your advisor for them.

Notes for reference

Goals to be achieved

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

Evaluation of achievement

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

[Evaluation basis] Students who attend this class will be evaluated as follows:
S: Achieved the high level of "master degree", 90 or higher (out of 100 points).
A: Left something to be desired, 80 or higher (out of 100 points).
B: Left something to be desired, 70 or higher (out of 100 points).
C: Left much to be desired, 60 or higher (out of 100 points).

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
(D1) 論文，口頭及び情報メディアを通じて，自分の論点や考えなどを国の内外において効果的に表現・発信し，コミュニケーションする能力を身につけている。
(D2) チーム内の個々の要員の価値観を互いに尊重するとともに，協調して，チームとしての目標達成に寄与できる高い能力を身につけている。
(E)最新の技術や社会環境の変化に対する探究心と持続的学習力
社会，環境，技術等の変化に対応して，生涯にわたって自発的に計画し学習する能力を身につけている。
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high-level skills to mutually respect the values of individual team members; and to contribute to the team's achievements through working cooperatively with other team members

(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high-level skills to mutually respect the values of individual team members; and to contribute to the team's achievements through working cooperatively with other team members
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, environment and technology

Key words

(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**	2～2
Department Offered	Computer Science and Engineering			**Beggining grade**	M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, 3系各教員 3kei kyomu Iin-S, 3kei kakukyouin				
Numbering	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

After the guidance by an individual adviser, the student is expected to conduct his/her research on his/her own with a pioneering spirit.

Related subjects

Consult with your advisor.

Notes for textbook

Consult with your advisor.

Notes for reference

Goals to be achieved

To acquire abilities for technical readings in English, logical thinking/explanation, and clear presentation.

Evaluation of achievement

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

[Evaluation basis] Students who attend this class will be evaluated as follows:
S: Achieved the high level of "master degree", 90 or higher (out of 100 points).
A: Left something to be desired, 80 or higher (out of 100 points).
B: Left something to be desired, 70 or higher (out of 100 points).
C: Left much to be desired, 60 or higher (out of 100 points).

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

(D)グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
(D1) 論文，口頭及び情報メディアを通じて，自分の論点や考えなどを国の内外において効果的に表現・発信し，コミュニケーションする能力を身につけている。
(D2) チーム内の個々の要員の価値観を互いに尊重するとともに，協調して，チームとしての目標達成に寄与できる高い能力を身につけている。
(E)最新の技術や社会環境の変化に対する探究心と持続的学習力
社会，環境，技術等の変化に対応して，生涯にわたって自発的に計画し学習する能力を身につけている。
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high-level skills to mutually respect the values of individual team members; and to contribute to the team's achievements through working cooperatively with other team members

(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high-level skills to mutually respect the values of individual team members; and to contribute to the team's achievements through working cooperatively with other team members
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, environment and technology

Key words

(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**	2～2
Department Offered	Computer Science and Engineering			**Beggining grade**	M2
Charge teacher name[Roman alphabet mark]	S3系教務委員 3kei kyomu Iin-S				
Numbering	CMP_MAS51015				

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

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

Examination

試験期間中には何も行わない

None during exam period

Details of examination

課題レポートやプレゼンテーションに基づいて評価する。

Your supervisor will evaluate your presentation and your reports.

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

(C)高度な知識を統合的に活用できる実践力・創造力

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

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

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

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

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

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

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

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

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

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

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

Key words

(M43630430)Information Security[Information Security]

Subject name[English]	Information Security[Information Security]				
Schedule number	M43630430	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Wed.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]	鈴木　幸太郎 SUZUKI Koutarou				
Numbering	CMP_MAS52025				

Objectives of class

情報セキュリティとくに暗号理論について基本的な内容を理解すること。
企業の研究所で情報セキュリティに関する研究開発に携わっていた教員が、その経験を生かして講義を行う。
To understand basic topics of information security especially cryptology.

Contents of class

(対面) 1 週. 情報セキュリティと暗号理論の概要
(対面) 2 週. 初等整数論の基礎
(対面) 3 週. 公開鍵暗号 1
(対面) 4 週. 公開鍵暗号 2
(対面) 5 週. 電子署名
(対面) 6 週. 楕円曲線暗号系
(対面) 7 週. より進んだ話題

本学の新型コロナウィルス感染拡大防止のための活動基準の変更に伴い、授業内容および成績の評価法に変更が生じる場合があります。
(face to face) week 1. overview of information security and cryptology
(face to face) week 2. basics of elementary number theory
(face to face) week 3. public key cryptography 1
(face to face) week 4. public key cryptography 2
(face to face) week 5. digital signature
(face to face) week 6. elliptic curve cryptosystem
(face to face) week 7. advanced topics

If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for Preventing the Spread of Corona virus, the course content and evaluation of achievement are subject to change.

Self Preparation and Review

本講義のオンラインコンテンツ等により予習、復習うことが推奨されます。
予習 90 分、復習 90 分程度が目安となります。
To enhance a learning effect, students are encouraged to refer to online contents of this lecture etc.
To prepare for and review the lecture for around 90 minutes each.

Related subjects

N／A
N／A

Notes for textbook

N／A
N／A

Notes for reference

・現代暗号への招待、黒澤、サイエンス社、暗号理論について読みやすく書かれている。
・公開鍵暗号の数理、森山ほか、共立出版、公開鍵暗号系について詳しく書かれている。
・クラウドを支えるこれからの暗号技術、光成、秀和システム、暗号に必要な数学について詳しく書かれている。
下記に公開版がある。
https://herumi.github.io/ango/
The followings are open textbooks of cryptology.
https://www.cs.umd.edu/~waa/414-F11/IntroToCrypto.pdf
https://crypto.stanford.edu/~dabo/cryptobook/

Goals to be achieved

情報セキュリティとくに暗号理論について基本的な内容を理解すること。

To understand basic topics of information security especially cryptology.

Evaluation of achievement

レポート 100%に基づき評価する。

評価基準は下記のとおり。

S: 達成目標を 90%達成しており、かつレポートと定期試験の合計点（100 点満点）が 90 点以上

A: 達成目標を 80%達成しており、かつレポートと定期試験の合計点（100 点満点）が 80 点以上

B: 達成目標を 70%達成しており、かつレポートと定期試験の合計点（100 点満点）が 70 点以上

C: 達成目標を 60%達成しており、かつレポートと定期試験の合計点（100 点満点）が 60 点以上

Evaluation is based on reports 100%.

Evaluation criteria is as follows.

S: Achieved at least 90% of goals, and obtained total points of reports and examination 90 or high (out of 100 points)

A: Achieved at least 80% of goals, and obtained total points of reports and examination 80 or high (out of 100 points)

B: Achieved at least 70% of goals, and obtained total points of reports and examination 70 or high (out of 100 points)

C: Achieved at least 60% of goals, and obtained total points of reports and examination 60 or high (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

N／A

N／A

Other information

N／A

N／A

Reference URL

N／A

N／A

Office hours

授業終了後。

After each class.

Relations to attainment objectives of learning and education

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

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

Key words

情報セキュリティ, 実務経験

information security, business experience

(M43630440)Auditory System and Sound Perception[Auditory System and Sound Perception]

Subject name[English]	Auditory System and Sound Perception[Auditory System and Sound Perception]				
Schedule number	M43630440	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Tue.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]	松井　淑恵 MATSUI Toshie				
Numbering	CMP_MAS53025				

Objectives of class

聴覚系のしくみとその特性を学びます。また、聴覚系を理解するための知覚実験と、その結果を用いた計算モデルについて概観します。

This course provides an introduction to the human auditory system. It also outlines various psychological experiments for understanding our auditory system, and computational models from the data.

Contents of class

1. 音の物理と聴覚のしくみ（対面）
2. 聴覚の生理学（オンデマンド）
3. 音の大きさ（オンデマンド）
4. 音の高さ （対面）
5. 音の音色　楽器と音声（対面）
6. 発声のしくみと音声の知覚（対面）
7. 聴覚の計算モデル化とその応用とまとめ（オンデマンド）

本学の新型コロナウィルス感染拡大防止のための活動基準の変更に伴い、授業内容および成績の評価法に変更が生じる場合があります。
授業実施形態が変更になる場合は，GoogleClassroom または教務情報システムより通知します。

Week 1. Physics of sounds and the auditory system (face-to-face)
Week 2. Physiology of the auditory system (on-demand)
Week 3. Loudness (on-demand)
Week 4. Pitch (face-to-face)
Week 5. Timber, instrumental sounds, and vocal sounds (face-to-face)
Week 6. Vocalization mechanism and perception of speech sounds (face-to-face)
Week 7. Computational models of the auditory system and its application, and other latest topics (on-demand)

If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for
Preventing the Spread of Corona virus, the course content and evaluation of achievement are subject to change.
If there are any changes about a class schedule, I will inform you on Google Classroom or KYOMU JOHO SYSTEM.

Self Preparation and Review

講義資料を事前に Google Classroom にて公開します。講義当日までにダウンロードしてください。
予習：講義資料に目を通し、知らない用語があれば調べておくこと（90 分）
復習：講義資料を見直し、前回までの講義内容と関連づけて整理する。講義中に示された参考資料に目を通す（90 分）
Lecture materials are disclosed to Google Classroom. Download them by the day of the lecture.
To prepare a lecture, read the lecture materials in advance and look up any terms you do not know (90 min required).
After a lecture, review the lecture materials and organize the contents of the previous lectures. Read the reference materials provided during the lecture (90 min required).

Related subjects

Visual Perception and Cognition, Speech and Natural Language Processing
Visual Perception and Cognition, Speech and Natural Language Processing

Notes for textbook

講義資料を事前に Google Classroom にて公開します。講義当日までにダウンロードしてください。
Lecture materials are disclosed to the Google Classroom. Download them by the day of the lecture.

Reference1	**Book title**	The Sense of Hearing, 3rd edition.	**ISBN**	978-1138632

	Author	Christopher J. Plack	**Publisher**	Routledge	**Publish year**	2018
Reference2	**Book title**	An Introduction to the Psychology of Hearing, 6th edition.			**ISBN**	978-9004252424
	Author	Brian C. J. Moore	**Publisher**	Brill Academic Pub	**Publish year**	2013

Notes for reference
特になし
N/A

Goals to be achieved
1. 聴覚の生理学的メカニズムとその機能の関連を理解する
2. 聴覚を理解するための知覚実験と計算論的アプローチ手法を学ぶ
1. Understand the relationship between physiological mechanism of the auditory system and its function
2. Learning the perceptual experiment techniques and computational approach to reveal the auditory system

Evaluation of achievement
成績の評価法: 最終レポートで評価します。
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します。

S: 達成目標をすべて達成しており、かつレポートの合計点(100 点満点)が 90 点以上
A: 達成目標を 90%達成しており、かつレポートの合計点(100 点満点)が 80 点以上
B: 達成目標を 80%達成しており、かつレポートの合計点(100 点満点)が 70 点以上
C: 達成目標を 70%達成しており、かつレポートの合計点(100 点満点)が 60 点以上
The evaluation is based primarily on a final report (100 points).
Students who attend all classes will be evaluated as follows:
S: Achieved all goals and obtained point of final report, 90 or higher (out of 100 points).
A: Achieved 90 % of goals and obtained point of final report, 80 or higher (out of 100 points).
B: Achieved 80 % of goals and obtained point of final report, 70 or higher (out of 100 points).
C: Achieved 70 % of goals and obtained point of final report, 60 or higher (out of 100 points).

Examination
レポートで実施
By Report

Details of examination
特になし
N/A

Other information
特になし
N/A

Reference URL
特になし
N/A

Office hours
随時対応します。メールなどで事前に連絡を取ってください。
On a necessary basis. Please contact me by e-mail in advance.

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

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

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

Key words
聴覚システム、聴知覚、音楽、音声、計算モデル
auditory system, sound perception, music, speech, computational model

(M43630450)Advanced Computer Architecture[Advanced Computer Architecture]

Subject name[English]	Advanced Computer Architecture[Advanced Computer Architecture]				
Schedule number	M43630450	**Subject area**	Advanced Computer Science and Engineering	**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	Computer Science and Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	佐藤　幸紀 SATO Yukinori				
Numbering	CMP_MAS52125				

Objectives of class

The goal is to obtain the knowledge on the advanced computer architecture seen in the state-of-the-art computing systems.

Contents of class

(face to face) Week 1 Introduction
(face to face) Week 2 Fundamentals of quantitative design and analysis (1)
(on-demand) Week 3 Fundamentals of quantitative design and analysis (2)
(on-demand) Week 4 Fundamentals of quantitative design and analysis (3)
(on-demand) Week 5 Fundamentals of quantitative design and analysis (4)
(face to face) Week 6 Memory Hierarchy design
(face to face) Week 7 Summary and discussion

If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for Preventing the Spread of Corona virus, the course content and evaluation of achievement are subject to change.

If there is any changes about a class schedule, I will inform you on Google Classroom or KYOMU JOHO SYSTEM.

Self Preparation and Review

To enhance a learning effect, students are encouraged to review the lecture for around 180 minutes each.
Review and prepare for the lecture using the provided materials and reference book.

Related subjects

N/A

Notes for textbook

Materials will be provided, which are based on a text book:
Computer Architecture, Sixth Edition: A Quantitative Approach
John Hennessy
David Patterson

Reference1	**Book title**	Computer architecture : a quantitative approach			**ISBN**	978-0128119051
	Author	John L. Hennessy, David A. Patterson ; with contributions by Krste Asanović ... [et al.]	**Publisher**	Morgan Kaufmann	**Publish year**	2018

Notes for reference

N/A

Goals to be achieved

At the end of the course, students will:
1: be able to understand the advanced design concepts of modern computing systems
2: be able to explain trade-off among performance and efficiency with consideration for power consumption, programabilitty, and hardware costs

Evaluation of achievement

Evaluations are done by reports (100%)/

S: 90% or more out of 100 points, S:90%, A: 80% or more, B: 70% or more C: 60% or more

Examination

レポートで実施

By Report

Details of examination

N/A

Other information

N/A

Reference URL

N/A

Office hours

Before/after the class

Relations to attainment objectives of learning and education

Key words

(M43630510)Information Visualization[Information Visualization]

Subject name[English]	Information Visualization[Information Visualization]				
Schedule number	M43630510	**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]	栗山 繁 KURIYAMA Shigeru				
Numbering	CMP_MAS52425				

Objectives of class

本講義では、大規模または多次元のデータを効率的かつ効果的に表示する可視化の設計手法を講述し、目的に応じた視覚的なデータ分析のワークフローを設計する制作実習によって、実践的な応用開発力を習得する。

This class teaches the design methodology of developing data exploration tools by efficiently and effectively visualizing huge size or dimension of dataset. Practical skill of developing the workflow of visual data analytics is learned through the exercises.

Contents of class

(オンデマンド)第1週:情報可視化の導入と概要説明
(オンデマンド)第2週:相関の可視化1(多変量データ)
(オンデマンド)第3週:構造の可視化(木構造・ネットワーク)
(オンデマンド)第4週:相関の可視化2(Glyph 表示)
(オンデマンド)第5週:テキスト・変動の可視化と対話操作
(オンデマンド)第6週:課題の説明と制作
(オンデマンド)第7週:制作課題発表
本学の新型コロナウィルス感染拡大防止のための活動基準の変更に伴い、授業内容および成績の評価法に変更が生じる場合があります。
(On demand) Week 1. Introduction and overview of information visualization
(On demand) Week 2. Correlation visualization of multivariate data
(On demand) Week 3. Relation visualization with tree and network representation
(On demand) Week 4. Visualization of correlation using glyph
(On demand) Week 5. Visualization of textual information and time-variation, and interactions
(On demand) Week 6. Exercise of developing a visualization tool
(On demand) Week 7: Presentation of exercise
If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for Preventing the Spread of Corona virus, the course content and evaluation of achievement are subject to change.

Self Preparation and Review

予習・復習のために、それまでに講義した内容と翌週の講義内容をe-ラーニングシステム(Google Classroom)で公開する。
All digital textbook are freely supplied on e-learning system developed on Google Classroom.

Related subjects

数値解析, 多変量解析, データマイニング特論
Numerical analysis, Multivariate analysis, Advanced Data Mining

Notes for textbook

e-ラーニングシステム(Google Classroom)に公開する電子テキストを使用する.
Digital textbook is supplied on an E-learning system of Google Classroom.

Notes for reference

特になし
N/A

Goals to be achieved

大規模、多次元のデータを効率的かつ効果的に可視化するデザイン手法を理解し、データの性質を考慮して最適な可視化ワークフローを設計できる技能を習得する
The goal of this class is to teach design methodology for efficiently and effectively visualizing huge size of multi-dimensional dataset, and to obtain the skill of designing the workflow of visual data analytics by considering the property of the data.

Evaluation of achievement

レポート課題の合計 100 点で採点する。
S:達成目標をすべて達成しており, かつ中間レポート, 出席, および制作課題の合計点(100 点満点)が 90 点以上

A：達成目標を 90%達成しており，かつ中間レポート，出席，および制作課題の合計点（100 点満点）が 80 点以上
B：達成目標を 75%達成しており，かつ中間レポート，出席，および制作課題の合計点（100 点満点）が 70 点以上
C：達成目標を 60%達成しており，かつ中間レポート，出席，および制作課題の合計点（100 点満点）が 60 点以上
The score is calculated by the Report(Exercise) of the total of 100 points
S: 90 or more, A: 80 or more, B: 70 or more, C: 60 or more

Examination
レポートで実施
By Report

Details of examination
制作課題の発表会を講義の最終回で実施する.
Presentation of final exercise is carried out at the final lecture.

Other information
特になし
N/A

Reference URL
特になし
N/A

Office hours
随時だが、電子メールで予約をとること。
Anytime, but requires reservation by E-mail.

Relations to attainment objectives of learning and education

情報・知能工学専攻
（C）高度な知識を統合的に活用できる実践力・創造力
情報・知能工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。
（C1） 情報・知能工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。

Graduate Program of Computer Science and Engineering for Master's Degree
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about computer science and engineering as well as related fields; and have the practical and creative skills to utilize suchknowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as related fields; and to utilize such knowledge in an integrated manner

Key words
情報検索、情報可視化、ビジュアル情報処理
Information visualization, Visual data analytics, Visual information processing

(M43630540)Computational Intelligence in Brain System[Computational Intelligence in Brain System]

Subject name[English]	Computational Intelligence in Brain System[Computational Intelligence in Brain System]				
Schedule number	M43630540	**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]	村越 一支 MURAKOSHI Kazushi				
Numbering	CMP_MAS53125				

Objectives of class

The aim of this class is to understand complex and intelligent systems.
To achieve the aim, this class offers knowledge and skills for mathematical modeling and simulation methods.

Contents of class

「本学の新型コロナウィルス感染拡大防止のための活動基準の変更に伴い、授業内容および成績の評価法に変更が生じる場合があります。」
授業実施形態が変更になる場合は，GoogleClassroom または教務情報システムより通知します。
A. Introduction
What is complex and intelligent systems? Outline of the brain system.
B. Computational Neuroscience and Application-oriented Mathematical Models
What is computational Neuroscience and artificial neural networks?
C. Model Neurons
Structure of neurons, synapse, model neurons.
D. Learning at connected part of neurons (synapse)
Synaptic plasticity, spike-timing-dependent plasticity (STDP).
E. Simulation Methods
Numerical calculation methods for single neuron, neural network from single neuron.
F. Simulation Environments
Explanation and demonstration of simulation environments such as NEURON and GENESIS.
G. Self-organizing
What is self-organizing? Winner Takes All, Self-organizing map (SOM)
H. Reinforcement Learning
What is reinforcement learning, reinforcement learning in the brain, demonstration of reinforcement learning for controlling robot
I. Summary

(face to face)1st week: A
(on-demand)2nd week: B
(on-demand)3rd week: C
(on-demand)4th week: D
(face to face)5th week: E F
(on-demand)6th week: G
(face to face)7th week: H I

Self Preparation and Review

Related subjects

Notes for textbook

Handouts are distributed.

Notes for reference

Goals to be achieved

- Know complex and intelligent mathematical models, and understand them at the degree which you can simulte them by your

programming or by using simulation environment.
- Can explain technical terms of complex and intelligent mathematical models.
- Master numerical calculation methods that are used in complex and intelligent mathematical models.

Evaluation of achievement

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

Examination

その他

Other

Details of examination

Other information

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

Reference URL

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

Office hours

After this class or

post question or consultation to the google classroom.

Relations to attainment objectives of learning and education

（C）高度な知識を統合的に活用できる実践力・創造力

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

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

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

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

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

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

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

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

Key words

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

Subject name[English]	Seminar on Applied Chemistry and Life Science 1[Seminar on Applied Chemistry and Life Science 1]				
Schedule number	M44610050	**Subject area**	Advanced Applied Chemistry and Life Science	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	3
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Applied Chemistry and Life Science			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	CHE_MAS55015				

Objectives of class

This course will provide the students with opportunities to study on his/her research subjects on applied chemistry and life science by reading textbooks and scientific papers under the guidance of his/her supervisor. The aim of the lessen for the students is to learn knowledge and presentation skills required for his/her research in the seminar as well as to deepen his/her understanding of applied chemistry and life science.

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 Applied Chemistry and Life Science 2
Thesis Research on Applied Chemistry and Life Science
All other relevant subjects in Applied Chemistry and Life Science

Notes for textbook

Supervisor will recommend textbooks, papers, and research materials to students.

Notes for reference

Goals to be achieved

To acquire basic knowledge on applied chemistry and life science
To understand the contents of scientific papers in a given field of applied chemistry and life science
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.
S: 90 or higher (out of 100 points),
A: 80 or higher (out of 100 points),
B: 70 or higher (out of 100 points),
C: 60 or higher (out of 100 points)

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Supervisor(s)

Reference URL

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

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

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

Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high-level skills to mutually respect the values of individual team member; and to contribute to the team's achievements through working cooperatively with other team members
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

Key words
Applied chemistry, Life science, Materials science and engineering

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

Subject name[English]	Seminar on Applied Chemistry and Life Science 2[Seminar on Applied Chemistry and Life Science 2]				
Schedule number	M44610060	**Subject area**	Advanced Applied Chemistry and Life Science	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	3
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～
Department Offered	Applied Chemistry and Life Science			**Beggining grade**	M2
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	CHE_MAS65015				

Objectives of class

Based on the Seminar on Applied Chemistry and Life Science 1, this course will further provide the students with the opportunity to study on his/her research subject in applied chemistry and life science 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 Applied Chemistry and Life Science 1
Thesis Research on Applied Chemistry and Life Science
All other relevant subjects in applied chemistry and life science

Notes for textbook

Supervisor will recommend textbooks, papers, and research materials to students.

Notes for reference

Goals to be achieved

To acquire basic knowledge on applied chemistry and life science
To understand the contents of scientific papers in a given field of applied chemistry and life science
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.
S: 90 or higher (out of 100 points),
A: 80 or higher (out of 100 points),
B: 70 or higher (out of 100 points),
C: 60 or higher (out of 100 points)

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Supervisor(s)

Reference URL

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

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words
Applied chemistry, Life science, Materials science and engineering

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

Subject name[English]	Thesis Research on Applied Chemistry and Life Science[Thesis Research on Applied Chemistry and Life Science]				
Schedule number	M44610070	**Subject area**	Advanced Applied Chemistry and Life Science	**Required or elective**	Required
Time of starting a course	2Years	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Applied Chemistry and Life Science			**Beggining grade**	M1, M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu Iin-S, 4kei kakukyouin				
Numbering	CHE_MAS68015				

Objectives of class

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

Contents of class

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

Self Preparation and Review

Related subjects

Seminar on Applied Chemistry and Life Science 1
Seminar on Applied Chemistry and Life Science 2

Notes for textbook

Supervisor will recommend textbooks, papers, and research materials to students.

Notes for reference

Goals to be achieved

To acquire basic knowledge on applied chemistry and life science
To master experimental techniques and analytical skills required for research on a given field of applied chemistry and life science
To be able to present and discuss on the results of his/her research
To be able to make safety control in experimental work

Evaluation of achievement

The score of the course is based on his/her master's thesis and the presentation in the final review of his/her master's thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).
S: 90 or higher (out of 100 points),
A: 80 or higher (out of 100 points),
B: 70 or higher (out of 100 points),
C: 60 or higher (out of 100 points)

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Supervisor

Reference URL

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

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

（C）高度な知識を統合的に活用できる実践力・創造力
応用化学・生命工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。
(C1) 応用化学・生命工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。
(C2) 応用化学・生命工学およびその関連分野の広範囲の知識の連携により，研究開発に対する方法論を体得して，研究開発の計画を立案および実践し，課題解決のための新たな技術を創造できる能力を身につけている。
（D）グローバルに活躍できるコミュニケーション力
グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で，自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。
(D1) 論文，口頭及び情報メディアを通じて，自分の論点や考えなどを国の内外において効果的に表現・発信し，コミュニケーションする能力を身につけている。
(D2) チーム内の個々の要員の価値観を互いに尊重するとともに，協調して，チームとしての目標達成に寄与できる高い能力を身につけている。
（E）最新の技術や社会環境の変化に対する探究心と持続的学習力
社会，環境，技術等の変化に対応して，生涯にわたって自発的に計画し学習する能力を身につけている。

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilizesuch knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and developmentand put them into practice; and to create new technologies to solve problems
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high-level skills to mutually respect the values of individual team member; and to contribute to the team's achievements through working cooperatively with other team members
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, environment and technology

Key words

Applied chemistry, Life science, Materials science and engineering

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

Subject name[English]	Thesis Research on Applied Chemistry and Life Science[Thesis Research on Applied Chemistry and Life Science]				
Schedule number	M44610070	**Subject area**	Advanced Applied Chemistry and Life Science	**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	Applied Chemistry and Life Science			**Beggining grade**	M1, M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu Iin-S, 4kei kakukyouin				
Numbering	CHE_MAS68015				

Objectives of class

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

Contents of class

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

Self Preparation and Review

Related subjects

Seminar on Applied Chemistry and Life Science 1
Seminar on Applied Chemistry and Life Science 2

Notes for textbook

Supervisor will recommend textbooks, papers, and research materials to students.

Notes for reference

Goals to be achieved

To acquire basic knowledge on applied chemistry and life science
To master experimental techniques and analytical skills required for research on a given field of applied chemistry and life science
To be able to present and discuss on the results of his/her research
To be able to make safety control in experimental work

Evaluation of achievement

The score of the course is based on his/her master's thesis and the presentation in the final review of his/her master's thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).
S: 90 or higher (out of 100 points),
A: 80 or higher (out of 100 points),
B: 70 or higher (out of 100 points),
C: 60 or higher (out of 100 points)

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Supervisor

Reference URL

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

Office hours Students are encouraged visiting by appointment.
Relations to attainment objectives of learning and education
Key words Applied chemistry, Life science, Materials science and engineering

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

Subject name[English]	Thesis Research on Applied Chemistry and Life Science[Thesis Research on Applied Chemistry and Life Science]				
Schedule number	M4461007T	**Subject area**	Advanced Applied Chemistry and Life Science	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Applied Chemistry and Life Science			**Beggining grade**	M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu Iin-S, 4kei kakukyouin				
Numbering	CHE_MAS68015				

Objectives of class

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

Contents of class

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

Self Preparation and Review

Related subjects

Seminar on Applied Chemistry and Life Science 1
Seminar on Applied Chemistry and Life Science 2

Notes for textbook

Supervisor will recommend textbooks, papers, and research materials to students.

Notes for reference

Goals to be achieved

To acquire basic knowledge on applied chemistry and life science
To master experimental techniques and analytical skills required for research on a given field of applied chemistry and life science
To be able to present and discuss on the results of his/her research
To be able to make safety control in experimental work

Evaluation of achievement

The score of the course is based on his/her master's thesis and the presentation in the final review of his/her master's thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).
S: 90 or higher (out of 100 points),
A: 80 or higher (out of 100 points),
B: 70 or higher (out of 100 points),
C: 60 or higher (out of 100 points)

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Supervisor(s)

Reference URL

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

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high-level skills to mutually respect the values of individual team member; and to contribute to the team's achievements through working cooperatively with other team members
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

Key words

Applied chemistry, Life science, Materials science and engineering

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

Subject name[English]	Seminar on Applied Chemistry and Life Science[Seminar on Applied Chemistry and Life Science]				
Schedule number	M44610080	**Subject area**	Advanced Applied Chemistry and Life Science	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Applied Chemistry and Life Science			**Beggining grade**	M2
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	CHE_MAS68015				

Objectives of class

This course will provide the students with the opportunity to study on his/her research subject in applied chemistry and life science by reading textbooks and papers under the guidance of his/her supervisor. The students will learn the knowledge and the presentation skills required for his/her research in the seminar.

Contents of class

The students will be expected to read textbooks and papers written by foreign language that are indicated by his/her supervisor, and report and discuss deeply on his/her research subject in the seminar.

Self Preparation and Review

Related subjects

Thesis Research on Applied Chemistry and Life Science
All other relevant subjects in Applied Chemistry and Life Sciences

Notes for textbook

Supervisor will recommend textbooks and papers to students.

Notes for reference

Goals to be achieved

To acquire basic knowledge on applied chemistry and life science
To understand the contents of scientific papers in a given field of applied chemistry and life science
To be able to make oral and poster presentations relevant to papers he/she has read

Evaluation of achievement

The evaluation is based on the scores of reading papers, discussions, reports and presentations of his/her research in the seminar. His/her supervisor evaluates the scores.
S: 90 or higher (out of 100 points),
A: 80 or higher (out of 100 points),
B: 70 or higher (out of 100 points),
C: 60 or higher (out of 100 points)

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Supervisor

Reference URL

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

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

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

Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems
(D) Communication skills for global success
Have the communication skills to effectively express one's own ideas and results while working on the issues faced by a globally changing society in cooperation with other team members
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(D2) Have high-level skills to mutually respect the values of individual team member; and to contribute to the team's achievements through working cooperatively with other team members
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

Key words
Applied chemistry, Life science, Materials science and engineering

(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 Applied Chemistry and Life Science	**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	Applied Chemistry and Life Science			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	岩佐 精二, 柴富 一孝 IWASA Seiji, SHIBATOMI Kazutaka				
Numbering	CHE_MAS53225				

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.

(face to face) 1. Total synthesis of bioactive organic compounds. (Iwasa)
(on-demand) 2. Advanced modern synthetic organic reactions using transition metals. (Iwasa)
(face to face) 3. Basic concept of oxidative addition and reductive elimination in catalytic cycles. (Iwasa)
(on-demand) 4. Synthetic applications of asymmetric synthesis and asymmetric catalysts. (Iwasa)
(face to face) 5. Basic concept of Lewis acid catalyst and organocatalyst. (Shibatomi)
(on-demand) 6. Advanced Lewis acid catalysis in organic synthesis. (Shibatomi)
(on-demand) 7. Advanced organocatalysis in organic synthesis. (Shibatomi)

If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for
Preventing the Spread of Corona virus, the course content and evaluation of achievement are subject to change.

If there is any changes about a class schedule, it will be informed via Google Classroom or KYOMU JOHO SYSTEM.

Self Preparation and Review

Preparation and review of the classes are strongly recommended.
e.g. 90 min for the preparation and 90 min for the review per each 90 min class.

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

N／A

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
N／A

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

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

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

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 Applied Chemistry and Life Science	**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	Applied Chemistry and Life Science			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	吉田 祥子, 沼野 利佳 YOSHIDA Sachiko, NUMANO Rika				
Numbering	CHE_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,
Week1 (remote simultaneous interactive): Properties of neuronal cells
Week2 (remote simultaneous interactive): Electrical function and ion transport
Week3 (remote simultaneous interactive): Chemical information transport
Week4 (remote simultaneous interactive): Development of neuronal circuit
Week5 (remote simultaneous interactive): Detection of chemical information
Week6 (remote simultaneous interactive): Detection of electrical information
Week7 (remote simultaneous interactive): Detection of cortical development

R Numano,
We pick up topics from chapter2 in Neuron To Brain 4th Ed.
(8)Neural inducer in vertebrates face to face (Regular face to face class)
(9)Notch and Delta genes on-demand(You can take the class whenever you want.)
(10)Polarity and Segmentation on-demand(You can take the class whenever you want.)
(11)Hox gene function in the nervous system on-demand(You can take the class whenever you want.)
(12)Hox gene function in the nervous system on-demand(You can take the class whenever you want.)
(13)Topic & Discussion face to face face to face (Regular face to face class)

If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for Preventing the Spread of Corona virus, the course content and evaluation of achievement are subject to change.

Self Preparation and Review

学習効果を上げるため，教科 書等の該当箇所を参考し，授業内容に関する予習(90 分程度)を行 い， 授業内容に関する復習(90 分程度)を行うことが望ましい。
90 minutes of preparation and 90 minutes of review are generally required for each class of 90 minutes.

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

特になし
N／A

Goals to be achieved

1)最新の神経科学の理解
2)現在の科学が直面する問題を提起し、独自で考察する。

1) You can understand neuroscience Topics .
2) You can consider the problem in life science.

Evaluation of achievement

Yoshida S.
Report: 100%
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%
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).

Examination

レポートで実施
By Report

Details of examination

Other information

S Yoshida
Room: B-406, E-mail:syoshida@tut.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

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

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

Key words

Neuroscience

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

Subject name[English]	Advanced Supercritical Fluid Engineering[Advanced Supercritical Fluid Engineering]				
Schedule number	M44630200	**Subject area**	Advanced Applied Chemistry and Life Science	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Fri.2～2	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Applied Chemistry and Life Science			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	大門 裕之 DAIMON Hiroyuki				
Numbering	CHE_MAS53225				

Objectives of class

Based on Supercritical Fluid Engineering and Environmental Chemical Engineering, practical philosophy, creativity and leadership of engineer are improved during this course. The topics are mainly waste management and utilization of biomass. Environmental issue is widely discussed to obtain the knowledge and organizing skill of comprehensive process or society.

Contents of class

(face to face) 1st Summary
(on-demand) 2nd History
(face to face) 3rd Physical property
(on-demand) 4th Application of Supercritical Water Technologies 1
(face to face) 5th Application of Supercritical Water Technologies 2
(on-demand) 6th Application of Supercritical Water Technologies 3
(face to face) 7th Application of Supercritical Carbon dioxide Technologies 1
(face to face) 8th Application of Supercritical Carbon dioxide Technologies 2

Self Preparation and Review

N／A

Related subjects

Advanced Analytical Separation Chemistry, Advanced Industrial Ecology

Notes for textbook

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

Notes for reference

N／A

Goals to be achieved

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

Evaluation of achievement

Based on Report
More than
90% ; S
80% ; A
70% ; B
60% ; C

Examination

レポートで実施
By Report

Details of examination

N／A

Other information

Office：Builing G, Floor 6th, Room 602
Tel:0532-44-6905
Email:daimon@tut.jp

Reference URL

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

Office hours

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

Relations to attainment objectives of learning and education

(D)

(A)幅広い人間性と考え方
人間社会を地球的な視点から多面的にとらえるグローバルな感性を持ち，人間と自然との共生，公共の福祉について考える能力を身につけている。
(B)技術者・研究者としての正しい倫理観と社会性
上級技術者・研究者として社会的・倫理的責任を有し，社会における技術的課題を設定・解決・評価する能力を身につけている。
(C)高度な知識を統合的に活用できる実践力・創造力
応用化学・生命工学およびその関連分野に関する高度な知識を修得し，それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。
>>(C1) 応用化学・生命工学およびその関連分野の理論・応用知識を自発的に獲得し，それらを統合的に活用できる能力を身につけている。

(D)

(A) Personality and outlook with a broad perspective
Have a mindset to see human society from various angles with a global perspective; and the ability to consider the symbiosis between humans and nature as well as public welfare
(B) Sound ethics and social awareness as advanced-level engineers and researchers
Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; and have the ability to set, solve and evaluatetechnical issues in society
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilizesuch knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner

Key words

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

(M44630290)Advanced Biomaterials Engineering[Advanced Biomaterials Engineering]

Subject name[English]	Advanced Biomaterials Engineering[Advanced Biomaterials Engineering]				
Schedule number	M44630290	**Subject area**	Advanced Applied Chemistry and Life Science	**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	Applied Chemistry and Life Science			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	辻 秀人, 手老 龍吾 TSUJI Hideto, TERO Ryugo				
Numbering	CHE_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 interactions in solutions between 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.

Biodevice and biosensing (Ryugo Tero):
(4) introduction of surface energy and interface energy, (5) molecular assembly in aqueous solution, (6) application to biomaterials and biodevices, and (7) sensing and imaging techniques relating to biomolecules and biomaterials.

If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for Preventing the Spread of Corona virus, the course content and evaluation of achievement are subject to change.
If there is any changes about a class schedule, I will inform you on Google Classroom or KYOMU JOHO SYSTEM.

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

N/A

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	**Publisher**	Springer	**Publish year**	2009

		Lahmani				

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 interactions in aqueous solutions relating to biodevice and biosensing (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 (G-402), e-mail (tero@tut.jp), phone: 6917 (Ryugo Tero)

Reference URL

N/A

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

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

Key words

実務経験

(M44630360)Advanced Reactive Plasma[Advanced Reactive Plasma]

Subject name[English]	Advanced Reactive Plasma[Advanced Reactive Plasma]				
Schedule number	M44630360	**Subject area**	Advanced Applied Chemistry and Life Science	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Mon.4～4	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Applied Chemistry and Life Science			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	髙島 和則 TAKASHIMA Kazunori				
Numbering	CHE_MAS52225				

Objectives of class

近年プラズマを用いたガス状汚染物質の浄化に代表される大気圧プラズマを用いた環境対策技術の研究開発が盛んになっていている。この分野においては放電現象に関する理解は欠くべからざる一つの基礎的事項である。本講義は放電の基礎過程を解説する。

To understand and fundamentals of gas discharge

Contents of class

1週目　　イントロダクション　（オンデマンド）
2週目　　気体の分子運動論　（オンデマンド）
3週目　　速度分布関数　（オンデマンド）
4週目　　平均自由行程・弾性衝突　（オンデマンド）
5週目　　電離1（衝突電離）、電離2（光電離・熱電離・電極の影響）　（オンデマンド）
6週目　　電子の消滅（拡散、再結合、付着、両極性拡散）　（オンデマンド）
7週目　　絶縁破壊（気体放電、タウンゼント放電、二次電子放出と付着の影響、タウンゼントの火花条件とパッシェンの法則）　（オンデマンド）

本学の新型コロナウィルス感染拡大防止のための活動基準の変更に伴い、授業内容および成績の評価法に変更が生じる場合があります。

week 1:　Introduction　（on-demand）
week 2:　Elements of kinetic theory of gases
week 3:　Elements of kinetic theory of gases (Boltzmann-Maxwell's molecular velocity distribution)　（on-demand）
week 4:　Elements of kinetic theory of gases (mean free path, elastic collision)　（on-demand）
week 5:　Ionization 1 (ionization by collision), Ionization 2 (photo ionization, thermal ionization, electrode effect)　（on-demand）
week 6:　Deionization (diffusion, recombination, attachment, ambipolar diffusion)　（on-demand）
week 7:　Breakdown（gas discharge, Townsend discharge, Effect of secondary emission and attachmen, Townsend criterion and Paschen law)　（on-demand）

The course content and evaluation of achievement are subject to change due to change in TUT Activity Restrictions Level for Preventing the Spread of COVID-19.

Self Preparation and Review

各回の講義内容に関すして予習および復習を行うことが望ましい。
標準的予習・復習時間: 授業90分につき予習90分＋復習90分

90 minutes of preparation and 90 minutes of review are generally required for each class of 90 minutes.

Related subjects

Notes for textbook

必要に応じて資料を配布

Handout will be given as needed

Notes for reference

Goals to be achieved
放電の基礎過程を理解する

To learn fundamentals of gas discharge

Evaluation of achievement
課題レポートにより評価する。
評価基準:原則的に下記のように成績を評価する。
S:達成目標をすべて達成しており，かつレポートの点数(100 点満点)が 90 点以上
A:達成目標の 80%を達成しており，かつレポートの点数(100 点満点)が 80 点以上
B:達成目標の 70%を達成しており，かつレポートの点数(100 点満点)が 70 点以上
C:達成目標の 60%を達成しており，かつレポートの点数(100 点満点)が 60 点以上
Students who attend all classes will be evaluated as follows:
S: Achieved all the goals and obtained points of reports, 90 or higher (out of 100 points).
A: Achieved 80% of goals and obtained points of reports, 80 or higher (out of 100 points).
B: Achieved 70% of goals and obtained points of reports, 70 or higher (out of 100 points).
C: Achieved 60% of goals and obtained points of reports, 60 or higher (out of 100 points).

Examination
レポートで実施
By Report

Details of examination

Other information
高島和則 ー 居室: G-504、内線番号: 6919、メールアドレス: takashima@chem.tut.ac.jp

Dr. Kazunori Takashima
Office: G-504 (phone 6919)
E-mail: takashima@chem.tut.ac.jp

Reference URL
記述なし

Office hours
随時応対可
ただし、事前にメールにて連絡すること。

Make an appointment by e-mail.

Relations to attainment objectives of learning and education

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

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilizesuch knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and developmentand put them into practice; and to create new technologies to solve problems

Key words

(M44630440)Advanced Molecular Design Chemistry 2[Advanced Molecular Design Chemistry 2]

Subject name[English]	Advanced Molecular Design Chemistry 2[Advanced Molecular Design Chemistry 2]				
Schedule number	M44630440	**Subject area**	Advanced Applied Chemistry and Life Science	**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	Applied Chemistry and Life Science			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	CHE_MAS52225				

Objectives of class

This course will provide the students with the opportunity to study on the selected subject in the realm of advanced molecular design chemistry.

Contents of class

The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course depend on his/her supervisor.

Weeks 1 through 15: Topics on advanced molecular design chemistry (face to face)

The course content and evaluation of achievement are subject to change due to change in TUT Activity Restrictions Level for Preventing the Spread of COVID-19.

Self Preparation and Review

Preparation (90 minutes) and review (90 minutes) are generally required for each class of 90 minutes.

Related subjects

Advanced Molecular Design Chemistry 1

Notes for textbook

Supervisor will recommend textbooks and papers to students.

Notes for reference

Goals to be achieved

To acquire advanced knowledge on advanced molecular design chemistry.
To be able to report and discuss the contents of textbooks and papers he/she has read.

Evaluation of achievement

The evaluation is based on the scores of reports, presentations, and examination.
His/her supervisor evaluates the scores.
S: 90 or higher (out of 100 points),
A: 80 or higher (out of 100 points),
B: 70 or higher (out of 100 points),
C: 60 or higher (out of 100 points)

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Supervisor

Reference URL

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

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

Key words
Applied chemistry, Life science, Materials science and engineering

(M44630460)Advanced Molecular Functional Chemistry 2[Advanced Molecular Functional Chemistry 2]

Subject name[English]	Advanced Molecular Functional Chemistry 2[Advanced Molecular Functional Chemistry 2]				
Schedule number	M44630460	**Subject area**	Advanced Applied Chemistry and Life Science	**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	Applied Chemistry and Life Science			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	CHE_MAS52225				

Objectives of class

This course will provide the students with the opportunity to study on the selected subject in the realm of advanced molecular functional chemistry.

Contents of class

The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course depend on his/her supervisor.

Weeks 1 through 15: Topics on advanced molecular functional chemistry (face to face)

The course content and evaluation of achievement are subject to change due to change in TUT Activity Restrictions Level for Preventing the Spread of COVID-19.

Self Preparation and Review

Preparation (90 minutes) and review (90 minutes) are generally required for each class of 90 minutes.

Related subjects

Advanced Molecular Functional Chemistry 1

Notes for textbook

Supervisor will recommend textbooks and papers to students.

Notes for reference

Goals to be achieved

To acquire advanced knowledge on advanced molecular functional chemistry.
To be able to report and discuss the contents of textbooks and papers he/she has read.

Evaluation of achievement

The evaluation is based on the scores of reports, presentations, and examination.
His/her supervisor evaluates the scores.
S: 90 or higher (out of 100 points),
A: 80 or higher (out of 100 points),
B: 70 or higher (out of 100 points),
C: 60 or higher (out of 100 points)

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Supervisor

Reference URL

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

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

Key words
Applied chemistry, Life science, Materials science and engineering

(M44630480)Advanced Molecular Biological Chemistry 2[Advanced Molecular Biological Chemistry 2]

Subject name[English]	Advanced Molecular Biological Chemistry 2[Advanced Molecular Biological Chemistry 2]				
Schedule number	M44630480	**Subject area**	Advanced Applied Chemistry and Life Science	**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	Applied Chemistry and Life Science			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	CHE_MAS52225				

Objectives of class

This course will provide the students with the opportunity to study on the selected subject in the realm of advanced molecular biological chemistry.

Contents of class

The classes will be given by his/her supervisor. The students will be required to read textbooks and papers but the type and contents of this course depend on his/her supervisor.

Weeks 1 through 15: Topics on advanced molecular biological chemistry (face to face)

The course content and evaluation of achievement are subject to change due to change in TUT Activity Restrictions Level for Preventing the Spread of COVID-19.

Self Preparation and Review

Preparation (90 minutes) and review (90 minutes) are generally required for each class of 90 minutes.

Related subjects

Advanced Molecular Biological Chemistry 1

Notes for textbook

Supervisor will recommend textbooks and papers to students.

Notes for reference

Goals to be achieved

To acquire advanced knowledge on advanced molecular biological chemistry.
To be able to report and discuss the contents of textbooks and papers he/she has read.

Evaluation of achievement

The evaluation is based on the scores of reports, presentations, and examination.
His/her supervisor evaluates the scores.
S: 90 or higher (out of 100 points),
A: 80 or higher (out of 100 points),
B: 70 or higher (out of 100 points),
C: 60 or higher (out of 100 points)

Examination

試験期間中には何も行わない
None during exam period

Details of examination

Other information

Supervisor

Reference URL

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

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

(C) Practical and creative skills to utilize advanced knowledge in an integrated manner
Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner
(C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner
(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about applied chemistry and life science as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changes in society, environment and technology

Key words
Applied chemistry, Life science, Materials science and engineering

(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_MAS51015				

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**	M2
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering	ARC_MAS61015				

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～
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_MAS61015				

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

(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 5kei kyomu Iin-S				
Numbering	ARC_MAS61015				

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 5kei kyomu Iin-S				
Numbering	ARC_MAS61015				

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**	2～2
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_MAS51015				

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

(M45630130)Advanced Study on Housing System and Housing Policy[Advanced Study on Housing System and Housing Policy]

Subject name[English]	Advanced Study on Housing System and Housing Policy[Advanced Study on Housing System and Housing Policy]				
Schedule number	M45630130	**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]	松島 史朗 MATSUSHIMA Shiro				
Numbering	ARC_MAS53025				

Objectives of class

国際世界では気候の変動、地震、内戦、貧困など多様な要因で人々が難民、亡命者、被災者として国境を越え、都市部へ流入し、社会問題化しているのは周知の事実であろう。そのような状況の中で、住宅供給の在り方が問われている。
学生は、各国におけるこうした状況下での住宅供給の状況について事例研究を行い、最終的にはケース教材として発展刺させることを目標とする。

To understand emerging architecture of humanity such as post-disaster temporary housing, refugee camp, and illegal residence. With increasing number of population moving into the urban area from suburbs, there emerge risks with which we have to cope, especially supply of housing and related facility has to be taken into account.
For the final projet, students are expected to conduct research to write a case study on such risks of their countries and examine necessary counter measures.

Contents of class

This course takes several topics about the issues stated above. Two classes are allocated to each topic in principle; in the first class a lecture is given by the instructor and in the second class, the presentation is given by the student who is assigned to each topic.
It may adopt case method with which students are expected to read cases on various topics regarding emerging risks related to architectural
and housing planning, design, and urban development. Students read cases prior to the class and, at the class, they will exchange their ideas
face to face in order to develop their original idas to knowledge. It is also expected to develop skills of debating. Instructor will provide
appropriate instruction in timely manner for the class discussion along with giving lecture at the class.
1. Introduction
2/3. Architecture after 3.11
4/5. Lecture on Architectural and Housing Development of the World
6/7. Revitalising the City and Empowering. Community Tie by the Community (Re) Development in Toyokawa Inari Shrine
Mid-term paper due: proposal of the final project
8/9. Yebisu Garden Place
10. Final Project Interim Presentation and collective review
11/12. Rainbow Town Tokyo Waterfront Development
13. Independent Desk Crit
14 Final presentation by students.

For the final project, students will write their own cases based on their research and give presentation at the last class. Final project may be either independent work or group project.
Because this is a small class and students have different backgrounds and interests, the contents of the class and schedule are subject to change according to her/his disciplines.
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Self Preparation and Review

教材は簡単にアクセスできるように Dreamcampus にアップし、その場で意見交換などもできるようセットしてあるので。効果的に活用されたい。こうした意見交換や教員の指導を受けながら事例研究をまとめていく。

Read a case and prepare for the answers to each question on the case.
Develop your own ideas in order to exchange them w/ your class mates to have more diverse views. Reading materials are to be uploaded on the Dreamcampus where you can have an easy acceccess to the material, may upload your opinion, and exchange ideasa with other students.
From the review of your project, you may revise and develop your argument for the future. Reflecting yourself by listening to others is the most important aspect to become a good practitioner.

Related subjects

Architectural/Civil Engineering practice experience preferred but not required.

Architectural/Civil Engineering practice experience preferred but not required.

Notes for textbook

Matsushima Shiro, Identity COmmunity Resiliency,Responsibilities of Society, University, and Architecture. Harvard Univerity Graduate School of Design, report on housing policies and their impacts on human life.
Cases shown above. Cases are subject to change.

(Reference)
TBA

Matsushima Shiro, Identity COmmunity Resiliency,Responsibilities of Society, University, and Architecture. Harvard Univerity Graduate School of Design, report on housing policies and their impacts on human life.
Cases shown above. Cases are subject to change.

(Reference)
TBA

Notes for reference

Because this field is getting important more than ever before, there are some new books available and students are encouraged to search for the up-dated information probably via internet.

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Goals to be achieved

To understand the needs or structure for humanity that involves various issues including design, procurement, and distribution systems of architecture from international point of view and from local standpoint.
To develop your own ideas and your ability of discussion based on the comparative research of your country and Japan about the problems discussed here.

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To develop your own ideas and your ability of discussion based on the comparative research of your country and Japan about

the problems discussed here.

Evaluation of achievement

Class participation (30%), final project of case writing (40%) , presentation by the students (30%), and contributiron to make the booklet that features the final projects (10%)

Class participation (30%), final project of case writing (40%) , presentation by the students (30%), and contributiron to make the booklet that features the final projects (10%)

Examination

その他

Other

Details of examination

Other information

D-707, Phone: 44-6835, Email: shirom@ace.tut.ac.jp

D-707, Phone: 44-6835, Email: shirom@ace.tut.ac.jp

Reference URL

http://mlab.ace.tut.ac.jp/

http://mlab.ace.tut.ac.jp/

Office hours

Every Tuesday 12:30 to 14:30 on sign-up basis
or by appointment via email

Every Tuesday 12:30 to 14:30 on sign-up basis
or by appointment via email

Relations to attainment objectives of learning and education

Key words

collective housing, community development, self build, camps, design practice

(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_MAS52025				

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

Review each lecture and prepare for the next class with reference to the textbook.

Related subjects

N/A

Notes for textbook

Papers(resume)will be distributed.

Notes for reference

N/A

Goals to be achieved

Evaluation of achievement

This credit is assigned for all the process for the oral presentation or report. But fundamentally the estimation of this class would depends on the supervisor of each laboratory.

Examination

レポートで実施

By Report

Details of examination

Report

Other information

N/A

Reference URL

N/A

Office hours

Before/after the class

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_MAS54025				

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

Review each lecture and prepare for the next class with reference to the textbook.

Related subjects

N/A

Notes for textbook

N/A

Notes for reference

N/A

Goals to be achieved

Understand the contents of the latest research papers and debate with supervisor.
Create a research paper (including English).

Evaluation of achievement

This credit is assigned for all the process for the oral presentation or report. But fundamentally the estimation of this class would depends on the supervisor of each laboratory.

Examination

レポートで実施
By Report

Details of examination

Report

Other information

N/A

Reference URL

N/A

Office hours

N/A

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_MAS53025				

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

Review each lecture and prepare for the next class with reference to the textbook.

Related subjects

N/A

Notes for textbook

Papers(resume)will be distributed.

Notes for reference

N/A

Goals to be achieved

Evaluation of achievement

This credit is assigned for all the process for the oral presentation or report. But fundamentally the estimation of this class would depends on the supervisor of each laboratory.

Examination

レポートで実施

By Report

Details of examination

Report

Other information

N/A

Reference URL

N/A

Office hours

N/A

Relations to attainment objectives of learning and education

Key words

(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**	Mon.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]	井上 隆信, 横田 久里子 INOUE Takanobu, YOKOTA Kuriko				
Numbering	ARC_MAS54025				

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

All lectures are face-to-face.

water quality change in environment and treatment system.
1 fundamental equation of the mass balance
2 piston flow model
3 complete mixing model
4 reaction rate
5 complete mixing model with reaction
6 piston flow model with reaction

drinking water treatment and waste water treatment
7 rapid sand filtration process
8 activated sludge treatment process
(Inoue)

Water pollutants and management
9-10 environmental standard
11-12 nutrients, organic matter
13-14 chemicals in water environment
(Yokota)

If there will be any changes regarding Toyohashi University of Technology Activity Restrictions Level for Preventing the Spread of Corona virus, the course content and evaluation of achievement are subject to change.

If there is any changes about a class schedule, I will inform you on Google Classroom or KYOMU JOHO SYSTEM.

Self Preparation and Review

Review each lecture and prepare for the next class with reference to the textbook.

Related subjects

N/A

Notes for textbook

No textbook is required for this class.

Notes for reference

N/A

Goals to be achieved

To understand the water pollution and environmental quality standard.
To understand the piston flow and complete mixing model

Evaluation of achievement

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

B: Achieved 70 % of goals and obtained total points of reports and presentation, 70 or higher (out of 100 points).
C: Achieved 60 % of goals and obtained total points of reports and presentation, 60 or higher (out of 100 points).

Examination

レポートで実施

By Report

Details of examination

N/A

Other information

N/A

Reference URL

N/A

Office hours

Wednesday 12:00- 13:00

Relations to attainment objectives of learning and education

Key words