Syllabus

International Master′s Degree Program

（2022-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]	S総合ー教務委員, 穂積 直裕, 大門 裕之, Lim Pang Boey, 岡田 浩, 岩内 章太郎, 畑山 要介, 稗田 睦子, 蔡 万里, 中村 大介, 武藤 浩行, 和泉 司, 社河内 友里, 齊藤 大樹, 浅井 良策, TAN WAI KIANSougou kyoiku kyomu Iin, HOZUMI Naohiro, DAIMON Hiroyuki, Lim Pang Boey, OKADA Hiroshi, IWAUCHI Shotaro, HATAYAMA Yosuke, HIEDA Mutsuko, SAI Banri, NAKAMURA Daisuke, MUTO Hiroyuki, IZUMI Tsukasa, SHAKOUCHI Yuri, SAITOH Taiki, ASAI Ryosaku, TAN WAI KIAN				
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 Iwauchi "Nihilism in Japan"
In this lecture, we will examine the existential consciousness of contemporary Japan.
In particular, we analyze the essence of nihilism and melancholy, the belief or insight
that everything is useless and nothing has any values, from a philosophical perspective.

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 Hieda "Sports Science in Japan"
There is a major development of knowledge in Sports Science in recent years in the world, and Japan is no exception.
In this lecture, students learn trends in Sports Science in Japan.

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 Asai "Subjective Construal reflected in the Japanese language"

Sentences like "The mountain range runs from north to south" and "The students get younger every year." suggest that a linguistic expression does not depict the real world as it is, but involves the language users' subjective construal of it. In the literal sense of the word, the mountain does not run, and the students do not get younger (but older), either.
More interestingly, the Japanese language is abundant in this kind of "subjective" expressions and are more likely to adopt "subjective" construal in encoding the situation than English and other languages. We will learn about what it is really meant by the notion of Subjective Construal through looking at a large number of Japanese linguistic data, and contrasting them with their less subjectively construed English translations.

15. On demand Tan "Transition towards sustainability and globalization: From Japan perspective"

Japan is known to be one of the world leaders in sustainability-focused reformation leading to new concepts and breakthrough technologies.　In this lecture, an overview of the transition from the perspective of culture and technology toward modern sustainability will be given, and most importantly, what can we learn from these to achieve sustainable development goals.

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。日本人と日本語で簡単な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。

対面か同時双方向かは Classroom か教務情報システムで指示します。学生は選択できません。

（対面/同時双方向）1. 発音
（対面/同時双方向）2. L.1
（対面/同時双方向）3. L.2
（対面/同時双方向）4. L.3
（対面/同時双方向）5. L.4
（対面/同時双方向）6. L.5
（対面/同時双方向）7. L.6
（対面/同時双方向）8. L.7
（対面/同時双方向）9. L.8
（対面/同時双方向）10. L.9
（対面/同時双方向）11. L10
（対面/同時双方向）12. L.11
（対面/同時双方向）13. L.12
（対面/同時双方向）14. L.13
（対面/同時双方向）15. 復習
（対面/同時双方向）16. 期末試験

「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。

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

Students cannot choose between face to face and remote simultaneous interactive.
It will be informed via Google Classroom or KYOMU JOHO SYSTEM.

(face to face /remote simultaneous interactive) 1. Pronunciation of Japanese
(face to face /remote simultaneous interactive) 2. Lesson 1 Hajimemashite. Watashi wa Heren desu.
(face to face /remote simultaneous interactive) 3. Lesson 2 O-kuni wa dochira desuka.
(face to face /remote simultaneous interactive) 4. Lesson 3 Sore wa nan desuka.

(face to face /remote simultaneous interactive) 5. Lesson 4 Watashi wa asa koohii o nomimasu.
(face to face /remote simultaneous interactive) 6. Lesson 5 Ima nan-ji desuka.
(face to face /remote simultaneous interactive) 7. Lesson 6 Ashita doko e ikimasu ka.
(face to face /remote simultaneous interactive) 8. Lesson 7 Juu-gatsu juu-go-nichi ni Nihon e kimashita. & Active learning
(face to face /remote simultaneous interactive) 9. Lesson 8 Kyooshitsu ni dare ga imasu ka. & Active learning
(face to face /remote simultaneous interactive) 10.Lesson 9 Yuubinkyoku wa doko ni arimasu ka. & Active learning
(face to face /remote simultaneous interactive) 11.Lesson 10 Nihon e robotto no kenkyuu ni kimashita. & Active learning
(face to face /remote simultaneous interactive) 12.Lesson 11 Fuji-san wa kireina yama desu. & Active learning
(face to face /remote simultaneous interactive) 13.Lesson 12 Ryokoo wa doo deshita ka. & Active learning
(face to face /remote simultaneous interactive) 14.Lesson 13 Shuumatsu ni nani oshitai desu ka. & Active learning
(face to face /remote simultaneous interactive) 15.Review
(face to face /remote simultaneous interactive) 16.Term exam.

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
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
特になし
N/A

Textbook1	**Book title**	Basic Japanese for Students Hakase 1 (はかせ1)			**ISBN**	9784883194056
	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)
https://www.3anet.co.jp/np/en/books/4062/
¥2,000(+tax)
https://www.3anet.co.jp/np/en/books/4062/

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
Key words Basic Japanese

(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, 柴田 隆行, 永井 萌土, 河村 庄造, 松原 真己, 足立 忠晴, 竹市 嘉紀, 安部 洋平 1kei kyomu Iin-S, SHIBATA Takayuki, NAGAI Moeto, KAWAMURA Shozo, MATSUBARA Masami, ADACHI Tadaharu, TAKEICHI Yoshinori, ABE Yohei				
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.

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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, 戸高 義一, 三浦 博己, 小林 正和, 伊﨑 昌伸, 横山 誠二, 安井 利明 1kei kyomu Iin-S, TODAKA Yoshikazu, MIURA Hiromi, KOBAYASHI Masakazu, IZAKI Masanobu, YOKOYAMA Seiji, YASUI Toshiaki				
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.

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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, 佐藤 海二, 佐野 滋則, 高山 弘太郎, 内山 直樹, 高木 賢太郎 1kei kyomu Iin-S, SATO Kaiji, SANO Shigenori, TAKAYAMA Kotaro, UCHIYAMA Naoki, TAKAGI Kentaro				
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.

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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, 中村 祐二, 松岡 常吉, 土井 謙太郎, 鈴木 孝司, 飯田 明由, 関下 信正, 柳田 秀記, 横山 博史 1kei kyomu Iin-S, NAKAMURA Yuji, MATSUOKA Tsuneyoshi, DOI Kentaro, SUZUKI Takashi, IIDA Akiyoshi, SEKISHITA Nobumasa, YANADA Hideki, YOKOYAMA Hiroshi				
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

(M41630310)Vibration Engineering[Vibration Engineering]

Subject name[English]	Vibration Engineering[Vibration Engineering]				
Schedule number	M41630310	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Spring1 term	**Day of the week,period**	Tue.2～2	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Mechanical Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	河村　庄造 KAWAMURA Shozo				
Numbering	MEC_MAS53025				

Objectives of class

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

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

Contents of class

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

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

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 や教務情報システムより通知します。

Modal analysis for multi degree of freedom system
(In-person) 1: Introduction of modal analysis, undamped system
(In-person) 2: A system with proportional viscous damping (1)
(In-person) 3: A system with proportional viscous damping (2)
(In-person) 4: Compensate of higher vibration modes

Component mode synthesis method
(In-person) 5: Formulation of sub-systems
(In-person) 6: Modal synthesis using constraint modes (1)
(In-person) 7: Modal synthesis using constraint modes (2)
(In-person) 8: Modal synthesis using non-constraint modes

There may be changes to course content and academic assessment methods following changes to activities to prevent the spread of COVID-19.
If there is any changes about a class schedule, it will be informed via 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, 次週の内容について参考資料等を参考に予習してくること.
Self-preparation and review are necessary.

Related subjects

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

Notes for textbook

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

Reference1	**Book title**	モード解析			**ISBN**	
	Author	長松昭男	**Publisher**	培風館	**Publish year**	
Reference2	**Book title**	部分構造合成法			**ISBN**	
	Author	長松昭男・大熊政明	**Publisher**	培風館	**Publish year**	
Reference3	**Book title**	振動工学－応用編－			**ISBN**	
	Author	安田仁彦	**Publisher**	コロナ社	**Publish year**	

Notes for reference
特になし
N/A

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

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

Evaluation of achievement
評価法　:達成目標の到達度を 2 回のレポート(100 点満点)で評価する.
評価基準:評価法による得点が 60 点以上の場合を合格(達成目標に到達した)とする.
　　なお得点によって達成の程度を明示する. 評価 S:90 点以上, 評価 A:80 点以上, 評価 B:70 点以上, 評価 C:60 点以上

Method: report (full score 100).
Level: achievement in the case upper 60 points.
Level S: upper 90 points, Level A: upper 80 points, Level B: upper 70 points, Level C: upper 60 points

Examination
レポートで実施
By Report

Details of examination
特になし
N/A

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

Reference URL
特になし
N/A

Office hours
E メール等で随時時間を打ち合わせる
Ask by E-mail.

Relations to attainment objectives of learning and education
特になし

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。
N/A

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

(M41630510)Advanced Agricultural Engineering[Advanced Agricultural Engineering]

Subject name[English]	Advanced Agricultural Engineering[Advanced Agricultural Engineering]				
Schedule number	M41630510	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Spring2 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]	髙山　弘太郎 TAKAYAMA Kotaro				
Numbering	MEC_MAS55025				

Objectives of class

（1）食料生産の基本となる植物を対象とした計測について概略と将来展望を理解する。
（2）植物を対象とした計測システムの設計・計測ができる知識と将来展望を身につける。
Learn fundamentals and future prospect of advanced agricultural engineering

Contents of class

(1) (On-demand) Advanced agricultural production in the world
(2) Environmental control for agricultural production Ⅰ
(3) (On-demand) Environmental control for agricultural production Ⅱ
(4) Measurement system for photosynthesis and transpiration of crop Ⅰ
(5) (On-demand) Measurement system for photosynthesis and transpiration of crop Ⅱ
(6) Plant growth monitoring with imaging robot Ⅰ
(7) (On-demand) Plant growth monitoring with imaging robot Ⅱ
(8) Review 45min, examination/reporting 45min

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

Self Preparation and Review

・To enhance the learning effect, students are encouraged to precheck the lecture materials that will be distributed before the lecture.
・Review the lecture materials after the lecture for around 90 minutes each.

Related subjects

N/A

Textbook1	**Book title**	N/A			**ISBN**	
	Author		**Publisher**		**Publish year**	

Notes for textbook

Handouts will be prepared by the lecturer.

Reference1	**Book title**	N/A			**ISBN**	
	Author		**Publisher**		**Publish year**	

Notes for reference

N/A

Goals to be achieved

(1) Acquire basic knowledge of advanced agricultural engineering
(2) Acquire adequate knowledge of environmental control and robotics in agriculture
(3) Acquire adequate knowledge of image analysis for control in agriculture

Evaluation of achievement

成績評価
Exam 10%, Report or Quiz 90%
Students who attend all classes will be evaluated as follows:
Ｓ:total score of examination and report is 90 points or higher.
Ａ:total score of examination and report is 80 points or higher.
Ｂ:total score of examination and report is 70 pointrs or higher.

C：total score of examination and report is 60 pointrs or higher.

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

Write a comment on Google Classroom if you have questions. The questions will be answered around the lecture time. In case you have personal or urgent questions, send an email directly to the lecturers.

12-13 on Mondy is mostly available.

Relations to attainment objectives of learning and education

(A)幅広い人間性と考え方

人間社会を地球的な視点から多面的にとらえ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。

(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。

(A) Personality and outlook with a broad perspective

Have an international mindset to see human society from various angles with a global perspective; and the ability to consider the symbiosis between humans and nature as well as publicwelfare

(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

Environmental control, Plant diagnosis, Robotization, Automation

(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。

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

Key words

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

Subject name[English]	Physics for Electronics 2[Physics for Electronics 2]				
Schedule number	M42630150	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Wed.3～3	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	松田 厚範, 服部 敏明, 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, photonics, electrodics, ion recognition reagent, and also to have overall knowledge on the latest technologies on these physical phenomena.

Contents of class

"Physics for Electronics 2" is composed of 3 topics of functional materials, electrodics, and ion recognition reagents based on chemical analysis, which will be delivered for four 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 ionics including Li-ion battery and fuel cell, and 5) Functional materials for optics including coatings, micro-optical components, and photonic devices.

The category of "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.

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

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

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

実務経験
functional materials, photonics, electrodisc, ion recognition reagent, chemical analysis

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

Subject name[English]	Electrical Technology and Materials 2[Electrical Technology and Materials 2]				
Schedule number	M42630190	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Tue.2～2	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	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 sub courses to choose from.

This lecture is implemented as an introduction to electrical energy systems and intended for students and other engineering disciplines. It is being useful as reference and self-study guide for the professional dealing with this important area. There are following three sub courses to choose from.

Contents of class

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

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

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

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

Self Preparation and Review

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.

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.

Related subjects

Basic electrical power engineering course is prerequisite.

Basic electrical power engineering course is prerequisite.

Notes for textbook

Materials will be prepared by the lecturer.

Materials will be prepared by the lecturer.

Notes for reference

Goals to be achieved

Evaluation of achievement

Marks are based on examinations(100%).
Marks are based on examinations(100%).

Examination

定期試験を実施（対面）
Examination(Face to Face)

Details of examination

N/A
N/A

Other information

N/A
N/A

Reference URL

(1) J. Larminie and A. Dicks: Fuel Cell Systems Explained (Wiley)
(2) M. Yoshio, R.J. Brodd and A. Kozawa: Lithium Ion Batteries: Science and Technologies (Springer-Verlag)
(3) E. Kuffel, W. Zaengel and J. Kuffel: High Voltage Engineering (Newnes)

(1) J. Larminie and A. Dicks: Fuel Cell Systems Explained (Wiley)
(2) M. Yoshio, R.J. Brodd and A. Kozawa: Lithium Ion Batteries: Science and Technologies (Springer-Verlag)
(3) E. Kuffel, W. Zaengel and J. Kuffel: High Voltage Engineering (Newnes)

Office hours

Relations to attainment objectives of learning and education

Key words

(M42630230)LSI Process 2[LSI Process 2]

Subject name[English]	LSI Process 2[LSI Process 2]				
Schedule number	M42630230	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Thu.2～2	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	澤田　和明, 石川　靖彦, 関口　寛人, 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.

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.
From the viewpoint of deep understanding of LSI processes, semiconductors devices including material desgin and an example of latest device will be lectured.

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.

Contents of class

Integrated circuits
Sensor processing
Optical devices
MEMS/NEMS
Latest MOS FETs
Current topics in IC/MEMS/sensor

Integrated circuits
Sensor processing
Optical devices
MEMS/NEMS
Latest MOS FETs
Current topics in IC/MEMS/sensor

Self Preparation and Review

毎回の講義内容を復習するとともに, 次週の内容についてテキスト等を参考に予習してくること
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
The basic knowledge on the quantum mechanics, thermodynamics, and electronics are desirable.

Semiconductor Physics, Master course

Notes for textbook

Physics of Semiconducotr Devices
S.M.Sze, Willy
Physics of Semiconducotr Devices
S.M.Sze, Willy

Notes for reference

特になし
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.
(1) To understand fundamental aspects on LSI process, and semiconductor devices including material design.
(2) To get the knowledge on the latest technologies on LSI process.

Evaluation of achievement
Reports (100%)
Reports (100%)

Examination
レポートで実施
By Report

Details of examination

Other information
K. Sawada (C-605)
sawada@ee.tut.ac.jp
Y. Ishikawa (C-607)
ishikawa@ee.tut.ac.jp
H. Sekiguchi (C-610)
sekiguchi@ee.tut.ac.jp
ext. 6744
T. Noda (C-611)
noda-t@eiiris.tut.ac.jp
ext. 6745
K.Sawada (C-605)
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Y. Ishikawa (C-607)
ishikawa@ee.tut.ac.jp
H. Sekiguchi (C-610)
sekiguchi@ee.tut.ac.jp
ext. 6744
T, Noada (C-611)
noda-t@eiiris.tut.ac.jp
ext. 6745

Reference URL
http://www.tut.ac.jp/english/introduction/02EE.pdf
(department)

http://www.int.ee.tut.ac.jp/
(devision)

http://www.tut.ac.jp/english/research/research_highlights.html
(research activities)
http://www.tut.ac.jp/english/introduction/02EE.pdf
(department)

http://www.int.ee.tut.ac.jp/
(devision)

http://www.tut.ac.jp/english/research/research_highlights.html
(research activities)

Office hours
book an appointment by e-mail, phone, etc.
book an appointment by e-mail, phone, etc.

Relations to attainment objectives of learning and education
(C)高度な知識を統合的・発展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，それらを広範囲に有機的に連携させた研究開発方法論を体得することで，課題解決のための独創的な技術を創造し，実践できる
能力を身につけている

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

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

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

Subject name[English]	Information and Communication Technology 2[Information and Communication Technology 2]				
Schedule number	M42630250	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Mon.3～3	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	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

Key words

wireless networks, medium access control, multi-hop, wireless communications, modulation/demodulation, MIMO

(M43610100)Supervised Research in Computer Science and Engineering[Supervised Research in Computer Science and Engineering]

Subject name[English]	Supervised Research in Computer Science and Engineering[Supervised Research in Computer Science and Engineering]				
Schedule number	M43610100	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Required
Time of starting a course	Spring term	**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 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

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) 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

(M43630080)Computers and Education[Computers and Education]

Subject name[English]	Computers and Education[Computers and Education]				
Schedule number	M43630080	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Mon.5～5	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Computer Science and Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	河合　和久 KAWAI Kazuhisa				
Numbering	CMP_MAS52225				

Objectives of class

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

Contents of class

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

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

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

Students are required to solve the problems mentioned above. To enhance a learning effect, students are encouraged to refer to course material. To prepare for and review the lecture for around 90 minutes each.

Related subjects

N/A

Notes for textbook

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

Reference1	**Book title**	JOUHOUKA KYOUIKUHOU (KAITEI SAN-HAN) *** in JAPANESE ***			**ISBN**	978-4-274-21920-7
	Author	Yasushi Kuno, et al.	**Publisher**	OHM-SHA	**Publish year**	2016

Notes for reference

N/A

Goals to be achieved

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

Evaluation of achievement

Weighting:
Reports 50%.
In class work 50%.

Grading scale:
90% and above S
80% – 89% A
70% – 79% B
60% – 69% C

Examination

授業を実施
Regular Class

Details of examination

N/A

Other information

N/A

Reference URL

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

Office hours

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

Relations to attainment objectives of learning and education

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

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

(M43630400)Molecular Simulation 1[Molecular Simulation 1]

Subject name[English]	Molecular Simulation 1[Molecular Simulation 1]				
Schedule number	M43630400	**Subject area**	Advanced Computer Science and Engineering	**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	Computer Science and Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	栗田　典之 KURITA Noriyuki				
Numbering	CMP_MAS53025				

Objectives of class

The objective of this class is to understand basis biophysical phenomena in the organisms based on the concept of quantum chemistry, that is, molecular orbital (MO) theory.
In achieving this objective, students will be required to attempt to acquire the elementary concepts in MO theory, and they will learn about the electronic properties of biological molecules such as proteins, RNA and DNA.
The objective of this class is to understand basis biophysical phenomena in the organisms based on the concept of quantum chemistry, that is, molecular orbital (MO) theory.
In achieving this objective, students will be required to attempt to acquire the elementary concepts in MO theory, and they will learn about the electronic properties of biological molecules such as proteins, RNA and DNA.

Contents of class

Considering the preliminary knowledge of the participates in this class, some topics from the following things will be chosen to be learned. All classes are on-demand.

(1) Basis and elementary concepts for molecular orbital (MO) theory (1st week)
(2) Applications of MO method to small molecules (2nd week)
(3) MO calculations for amino acids and their peptides (3rd week)
(4) MO calculations for DNA, RNA bases and base pairs (4th week)
(5) MO calculations for complexes with proteins and ligand molecules (5th week)
(6) MO calculations for DNA, RNA and their complexes with proteins (6th, 7th weeks)

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.
Considering the preliminary knowledge of the participates in this class, some topics from the following things will be chosen to be learned. All classes are on-demand.

(1) Basis and elementary concepts for molecular orbital (MO) theory (1st week)
(2) Applications of MO method to small molecules (2nd week)
(3) MO calculations for amino acids and their peptides (3rd week)
(4) MO calculations for DNA, RNA bases and base pairs (4th week)
(5) MO calculations for complexes with proteins and ligand molecules (5th week)
(6) MO calculations for DNA, RNA and their complexes with proteins (6th, 7th weeks)

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

Elementary concepts in MO theory as well as biomolecules such as proteins, RNA and DNA are required.
Elementary concepts in MO theory as well as biomolecules such as proteins, RNA and DNA are required.

Related subjects

特になし
N／A

Textbook1	**Book title**	量子生物学入門			**ISBN**	
	Author	永田親義	**Publisher**	学会出版センタ	**Publish year**	1993

				ー		

Notes for textbook
教科書:資料配付
参考書:
"Molecular orbital calculations for amino acids and peptides", by Anne-Marie Sapse

"Molecular orbital calculations for amino acids and peptides", by Anne-Marie Sapse

Notes for reference
特になし
N／A

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

Evaluation of achievement
授業で与えられた課題に対するレポート内容で、総合的に評価する。
S:合計点が 90 点(100 点満点)以上。
A:合計点が 80 点(100 点満点)以上。
B:合計点が 70 点(100 点満点)以上。
C:合計点が 60 点(100 点満点)以上。
Evaluation is based on reports (100 points).
S: total points of reports, 90 or higher (out of 100 points).
A: total points of reports, 80 or higher (out of 100 points).
B: total points of reports, 70 or higher (out of 100 points).
C: total points of reports, 60 or higher (out of 100 points).

Examination
レポートで実施
By Report

Details of examination
特になし
N／A

Other information
連絡先
教員の居室:F 棟 306 号室
電話番号:0532－44－6875
E-mail: kurita@cs.tut.ac.jp
E-mail: kurita@cs.tut.ac.jp

Reference URL
特になし
N／A

Office hours
上記の E-mail による連絡により、適宜対応する。
Please contact by the above E-mail.

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
DNA, RNA, Protein, molecular orbital calculation
DNA, RNA, Protein, molecular orbital calculation

(M43630410)Molecular Simulation 2[Molecular Simulation 2]

Subject name[English]	Molecular Simulation 2[Molecular Simulation 2]				
Schedule number	M43630410	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Tue.5～5	**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]	後藤　仁志 GOTO Hitoshi				
Numbering	CMP_MAS53025				

Objectives of class

この授業の目標は、生物を含む分子や有機物の特性を予測するために使用される古典力学ベースの分子シミュレーションの基礎科学を学び、または分子原子スケールで自然現象を理解することです。
この目標を達成するために、受講生は分子力学(MM)および分子動力学(MD)法の基本的な知識を学び、分子計算プログラム(アプリケーション)をいこなすために必要な技術を習得します。
The goal of this class is to learn the basic science of classical mechanics-based molecular simulations used to predict the properties of molecules and organic matter, including living organisms, and to understand natural phenomena on a molecular atomic scale.
To achieve this goal, students will learn the basic knowledge of molecular mechanics (MM) and molecular dynamics (MD) methods, and acquire the techniques necessary to use molecular calculation programs (applications).

Contents of class

受講生は次の項目のトピックを学びます:
(1)分子シミュレーションの概要(第 1 週)
(2)分子力学(MM)法およびローカル/グローバル最小検索法(2 週目および 3 週目)
(3)分子動力学(MD)法と運動方程式(4 週目と 5 週目)
(4)統計熱力学と観測された振動数の比較(6 週目)
(5)古典力学のノーマルモード振動解析とパラメータ最適化(7 週目)
ほとんどすべての講義は、同時双方向またはオンデマンドのオンライン会議システムを使って行われます。
Students will learn the topics of the following things:
(1) Outline of molecular simulation (1st week)
(2) Molecular mechanics (MM) method and local/global minimum search method (2nd and 3rd weeks)
(3) Molecular dynamics (MD) method and motion equation (4th and 5th weeks)
(4) Statistical thermodynamics and comparison of vibrational frequencies observed (6th week)
(5) Normal mode vibrational analysis and parameter optimization for the classical mechanics (7th weeks)
Almost all lectures will be conducted in a simultaneous bidirectional or on demand online meeting system.

Self Preparation and Review

各授業回毎に 60 分の予習と 90 分の復習が必要です。
60-minute preparation and 90-minute review are required for each lecture.

Related subjects

分子シミュレーション特論1
Molecular Simulation 1

Notes for textbook

PDF ドキュメントは学習管理システム(LMS)によって配布されます

PDF documents will be distributed by learning management system (LMS)

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

Notes for reference

特になし。

N/A

Goals to be achieved

(1)古典力学に基づく分子シミュレーションの基礎理論を理解する。
(2)計算の妥当性を判断することができる。
(3)計算結果の検証ができる。
(1) Understand the basic theory of molecular simulation based on classical mechanics.
(2) The validity of the calculation can be judged.
(3) The verification of the calculation result can be performed.

Evaluation of achievement

【評価基準】全授業に参加する学生は、以下のように評価されます。
S:すべての目標を達成し、試験とレポートの総合点を 90 点以上(100 点中)獲得する。
A:目標の 80%を達成し、試験とレポートの総合点を 80 点以上(100 点中)獲得する。
B:目標の 65%を達成し、試験とレポートの総合点を 70 点以上(100 点中)獲得する。
C:目標の 50%を達成し、試験とレポートの総合点を 60 点以上(100 点中)獲得する。
[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% of goals and obtained total points of exam and reports, 80 or higher (out of 100 points).
B: Achieved 65% of goals and obtained total points of exam and reports, 70 or higher (out of 100 points).
C: Achieved 50% of goals and obtained total points of exam and reports, 60 or higher (out of 100 points).

Examination

授業を実施
Regular Class

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

事前に電子メールで連絡してください。
Please contact by E-mail in advance.

Relations to attainment objectives of learning and education

Key words

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

(M43630460)Statistical Machine Learning Theory[Statistical Machine Learning Theory]

Subject name[English]	Statistical Machine Learning Theory[Statistical Machine Learning Theory]				
Schedule number	M43630460	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Thu.2～2	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Computer Science and Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	渡辺　一帆 WATANABE Kazuho				
Numbering	CMP_MAS52425				

Objectives of class

機械学習手法はパターン認識・データマイニング等の基本技術として幅広く応用されている。
本講義では、統計的推測としての機械学習手法の基本原理や性質を理解することを目標とする。

The objective of this course is to learn the fundamental theory of statistical machine learning as statistical inference, which has wide applications such as pattern recognition and data mining.

Contents of class

（対面）　第1週：概論，確率モデルの基礎
（オンデマンド）第2週：最尤推定，推定量の性質
（対面）　第3週：判別モデル，最適化法
（オンデマンド）第4週：正則化，モデル選択
（対面）　第5週：ベイズ学習，サンプリング法
（オンデマンド）第6週：潜在変数モデル，EM アルゴリズム
（対面）　第7週：経験ベイズ法，近似ベイズ学習
（オンデマンド）第8週：統計的学習理論

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) 1. Introduction, Fundamentals of Probabilistic Models
(on-demand)　2. Maximum Likelihood Method, Properties of Estimator
(face-to-face) 3. Discriminative Model, Optimization Methods
(on-demand)　4. Regularization Methods, Model Selection
(face-to-face) 5. Bayesian Learning, Sampling Method
(on-demand)　6. Latent Variable Model, EM Algorithm
(face-to-face) 7. Empirical Bayes Method, Approximate Bayesian Learning
(on-demand)　8. Statistical Learning Theory

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

各回の内容を参考書等で予習し（90 分）、小演習やその類題を復習する（90 分）。

It is desirable to prepare each class by reading reference books (90 min.) and review each class by solving assigned exercises (90 min.).

Related subjects

特になし

N／A

Notes for textbook

講義スライドを配布

Lecture slides are distributed.

Reference1	**Book title**	Information theory, inference, and learning algorithms			**ISBN**	978-0521642989
	Author	David J.C. MacKay	**Publisher**	Cambridge University Press	**Publish year**	2003
Reference2	**Book title**	Pattern recognition and machine learning			**ISBN**	978-0387310732
	Author	Christopher M. Bishop	**Publisher**	Springer	**Publish year**	2006
Reference3	**Book title**	Algebraic geometry and statistical learning theory			**ISBN**	978-0521864671
	Author	Sumio Watanabe	**Publisher**	Cambridge University Press	**Publish year**	2009

Notes for reference

特になし

N／A

Goals to be achieved

1) 代表的な機械学習手法についての基本的な知識と理解
2) 基本的な確率モデルと学習法について学習アルゴリズムが導出できること
3) 学習法の汎化性能について基礎的な理解を得ること
1) Fundamental knowledge and understanding of popular machine learning methods
2) Ability to derive learning algorithms for fundamental probabilistic models and learning methods
3) Fundamental understanding of generalization capabilities of learning methods

Evaluation of achievement

レポートにより評価する。
評価基準:原則的にすべての講義に出席したものにつき、下記のように成績を評価する。
S:達成目標をすべて達成しており，かつレポートの点(100 点満点)が 90 点以上
A:達成目標を 80%達成しており，かつレポートの点(100 点満点)が 80 点以上
B:達成目標を 60%達成しており，かつレポートの点(100 点満点)が 70 点以上
C:達成目標を 40%達成しており，かつレポートの点(100 点満点)が 60 点以上
Scores will be measured comprehensively by the points of the small exercises assigned in several classes:
[Evaluation basis] Students who attend all classes will be evaluated as follows:
S: Achieved all goals and obtained average points of the report, 90 or higher (out of 100 points).
A: Achieved 80 % of goals and obtained points of the report, 80 or higher (out of 100 points).
B: Achieved 60 % of goals and obtained points of the report, 70 or higher (out of 100 points).
C: Achieved 40 % of goals and obtained points of the report, 60 or higher (out of 100 points).

Examination

授業を実施
Regular Class

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(必要に応じ e-mail 等で日時を打ち合わせる)
as needed (contact via email etc. if needed)

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 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
機械学習，統計的推測，統計的学習理論
Machine Learning, Statistical Inference, Statistical Learning Theory

(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

N/A

Office hours

After this class or
post question or consultation to the google classroom.

Relations to attainment objectives of learning and education

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

Key words

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

Subject name[English]	Special Topics in Applied Organic Chemistry[Special Topics in Applied Organic Chemistry]				
Schedule number	M44630100	**Subject area**	Advanced 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]	柴富 一孝 SHIBATOMI Kazutaka				
Numbering	CHE_MAS52225				

Objectives of class

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

Contents of class

(face to face) 1. Basic concept of asymmetric synthesis.
(face to face) 2. Basic concept of Lewis acid catalysis.
(on-demand) 3. Advanced Lewis acid catalysis.
(face to face) 4. Basic concept of organocatalyst.
(on-demand) 5. Advanced organocatalysis in organic synthesis.
(face to face) 6. Asymmetric synthesis of halogenated compounds.
(on-demand) 5. Advanced asymmetric synthesis.

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.
[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:
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

Key words

molecular catalyst, asymmetric synthesis, Lewis acid

(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-301B, E-mail:syoshida@tut.jp
R Numano
Room: G-407, E-mail:numano@tut.jp

Reference URL

特になし
N／A

Office hours

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。
>>(D1) 論文，口頭及び情報メディアを通じて，自分の論点や考えなどを国の内外において効果的に表現・発信し，コミュニケーションする能力を身につけている。
(E)最新の技術や社会環境の変化に対する探究心と持続的学習力
社会，環境，技術等の変化に対応して，生涯にわたって自発的に計画し学習する能力を身につけている。

(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
(D1) Have the skills to effectively express and communicate one's own ideas as well as points in question at home and abroad through papers, oral reports or information media
(E) Inquisitive outlook and skills for continuous learning in response to state-of-the-art technology and changes in the social environment
Have the skills to voluntarily make plans and learn throughout one's life in response to changesin society, environment and

technology

Key words
Neuroscience

(M44630180)Advanced Reaction Engineering[Advanced Reaction Engineering]

Subject name[English]	Advanced Reaction Engineering[Advanced Reaction Engineering]				
Schedule number	M44630180	**Subject area**	Advanced Applied Chemistry and Life Science	**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	Applied Chemistry and Life Science			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	小口 達夫 OGUCHI Tatsuo				
Numbering	CHE_MAS52225				

Objectives of class

This course will provide students with the opportunity to understand the basic reaction kinetics and dynamics. Especially, experimental and theoretical treatment of reaction rate constants will be given. Some reaction mechanisms in combustion or atmosphere will be also discussed.

This course will provide students with the opportunity to understand the basic reaction kinetics and dynamics. Especially, experimental and theoretical treatment of reaction rate constants will be given. Some reaction mechanisms in combustion or atmosphere will be also discussed.

Contents of class

1. Introduction.
2. Chemical reaction and rate theory.
3. Reaction mechanism.
4. Thermodynamics of reaction.
5. Reaction rate theory. (1)
6. Reaction rate theory. (2)
7. Reaction rate theory. (3)
8. Summary

All lectures will be given as "In-person" style (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.

1. Introduction.
2. Chemical reaction and rate theory.
3. Reaction mechanism.
4. Thermodynamics of reaction.
5. Reaction rate theory. (1)
6. Reaction rate theory. (2)
7. Reaction rate theory. (3)
8. Summary

All lectures will be given as "In-person" style (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

N/A

N/A

Related subjects

N/A

N/A

Notes for textbook

(Textbook is not used.)

(Textbook is not used.)

Notes for reference

(Reference book)

Paul L. Houston, "Chemical Kinetics and Reaction Dynamics", McGrawHill.

(A study-aid book)
Steingfeld, Francisco, and Hase, "Chemical Kinetics and Dynamics", Prentice-hall, 1989.
(Reference book)
Paul L. Houston, "Chemical Kinetics and Reaction Dynamics", McGrawHill.

(A study-aid book)
Steingfeld, Francisco, and Hase, "Chemical Kinetics and Dynamics", Prentice-hall, 1989.

Goals to be achieved

Understanding reaction rate theory, reaction mechanisms.
Understanding reaction rate theory, reaction mechanisms.

Evaluation of achievement

Grades for the course will be based on the reports.
Grades for the course will be based on the reports.

Examination

レポートで実施
By Report

Details of examination

N/A
N/A

Other information

N/A
N/A

Reference URL

N/A
N/A

Office hours

Any time, but e-mail is required in advance.
Any time, but e-mail is required in advance.

Relations to attainment objectives of learning and education

Physical chemistry and thermodynamics.

応用化学・生命工学専攻
(C)高度な知識を統合的に活用できる実践力・創造力
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。
(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。
Physical chemistry and thermodynamics.

Graduate Program of Applied Chemistry and Life Science for Master's Degree
(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
(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

Reaction, Rate Theory, Transition State Theory, Lindemann Mechanism.
Reaction, Rate Theory, Transition State Theory, Lindemann Mechanism.

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

Subject name[English]	X-ray Spectroscopy for Catalytic Engineering[X-ray Spectroscopy for Catalytic Engineering]				
Schedule number	M44630280	**Subject area**	Advanced Applied Chemistry and Life Science	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Tue.3～3	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Applied Chemistry and Life Science			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	水嶋 生智 MIZUSHIMA Takanori				
Numbering	CHE_MAS52225				

Objectives of class

To gain knowledge of X-ray spectroscopic techniques including X-ray diffraction, X-ray absorption fine structure (XAFS), and fluorescent X-ray spectroscopy as analytical tools for solid catalysts.

Contents of class

On-demand 1st week Fundamentals of X-ray and its spectroscopy
On-demand 2nd week Principle, measurement, and application of X-ray diffraction
Face to face 3rd week Experimental practice of X-ray diffraction
On-demand 4th week Principle, measurement, and analysis of XAFS
On-demand 5th week Application of XAFS to catalyst characterization
On-demand 6th week Advanced XAFS techniques and their applications
On-demand 7th week Principle, measurement, and application of fluorescent X-ray spectroscopy
Face to face 8th week Review and 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

To enhance a learning effect, students are encouraged to prepare for and review the lecture for around 90 minutes each.

Related subjects

It is advisable to have basic knowledge of physical and inorganic chemistry.

Notes for textbook

No textbook is required. A printed synopsis of the class will be given.

(Reference)
Y.Iwasawa et al., "X-ray absorption fine structure for catalysts and surfaces", World Scientific

Notes for reference

Goals to be achieved

(1) Understanding of basics of X-ray spectroscopy
(2) Understanding of X-ray diffraction, XAFS, and fluorescent X-ray spectroscopy as analytical tools for solid catalysts.

Evaluation of achievement

Reports(50%), Examination(50%)

Examination

定期試験を実施(対面)
Examination(Face to Face)

Details of examination

Other information

Takanori Mizushima, room : B-302, e-mail: mizushima@chem.tut.ac.jp

Reference URL

Office hours

Anytime

Relations to attainment objectives of learning and education

Key words

X-ray spectroscopy, X-ray diffraction, XAFS, Fluorescent X-ray spectroscopy, Solid catalysts

(M44630290)Advanced Biomaterials Engineering[Advanced Biomaterials Engineering]

Subject name[English]	Advanced Biomaterials Engineering[Advanced Biomaterials Engineering]				
Schedule number	M44630290	**Subject area**	Advanced 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

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.

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 (face to face), (2) molding, crystallization, and physical properties (remote simultaneous interactive), (3) hydrolytic degradation and biodegradation (face to face).

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

Notes for reference
Reference book 3 (Ryugo Tero):
http://link.springer.com/book/10.1007%2F978-3-642-28030-6

Goals to be achieved
To understand the fundamentals and applications of biobased and biodegradable polymers (Hideto Tsuji).
To understand the fundamentals and applications of 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。
>>(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。

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

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

応用化学・生命工学専攻
(C)高度な知識を統合的に活用できる実践力・創造力
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。
(E)最新の技術や社会環境の変化に対する探究心と持続的学習力
社会，環境，技術等の変化に対応して，生涯にわたって自発的に計画し学習する能力を身につけている。

Graduate Program of Applied Chemistry and Life Science for Master's Degree
(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
(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
実務経験

(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, 松本 明彦, 齊戸 美弘, 吉田 絵里, 原口 直樹, 有吉 誠一郎 4kei kyomu Iin-S, MATSUMOTO Akihiko, SAITO Yoshihiro, YOSHIDA Eri, HARAGUCHI Naoki, ARIYOSHI Seiichiro				
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

N/A

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

N/A

Other information

N/A

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, 辻 秀人, 水嶋 生智, 小口 達夫, 柴富 一孝, 大門 裕之 4kei kyomu Iin-S, TSUJI Hideto, MIZUSHIMA Takanori, OGUCHI Tatsuo, SHIBATOMI Kazutaka, DAIMON Hiroyuki				
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

N/A

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

N/A

Other information

N/A

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, 浴 俊彦, 髙島 和則, 田中 照通, 手老 龍吾, 栗田 弘史, 広瀬 侑, 吉田祥子, 沼野 利佳, 中鉢 淳 4kei kyomu Iin-S, EKI Toshihiko, TAKASHIMA Kazunori, TANAKA Terumichi, TERO Ryugo, KURITA Hirofumi, HIROSE Yu, YOSHIDA Sachiko, NUMANO Rika, NAKABACHI Atsushi				
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

N/A

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

N/A

Other information

N/A

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

(M45610011)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	M45610011	**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**	1～1
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_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

(M45610031)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	M45610031	**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

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

Subject name[English]	Seismic Evaluation of Existing Buildings[Seismic Evaluation of Existing Buildings]				
Schedule number	M45630030	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Thu.3～3	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Architecture and Civil Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	松井 智哉 MATSUI Tomoya				
Numbering	ARC_MAS52125				

Objectives of class

This course is intended to introduce the Japanese seismic evaluation method for existing buildings, in particular, reinforced concrete buildings. The concept and procedures of this method are outlined in this course, to gain advanced knowledge to evaluate seismic performance of existing buildings.

This course is intended to introduce the Japanese seismic evaluation method for existing buildings, in particular, reinforced concrete buildings. The concept and procedures of this method are outlined in this course, to gain advanced knowledge to evaluate seismic performance of existing buildings.

Contents of class

1: Introduction
2: Procedure of Seismic Evaluation
3: Seismic Index of Structure: IS
4: Irregularity and Time Indexes: SD and T
5: First Level Screening Procedure
6: Second Level Screening Procedure –Basic Seismic Index of Structure: E0–
7: Second Level Screening Procedure –Strength Index: C–
8: Second Level Screening Procedure –Ductility Index: F–
9: Judgment on Seismic Safety
10: Recent Earthquake Disasters
11: Introduction of Seismic Retrofit
12: Observation of Retrofitted Buildings
13: Observation of Structural Testing
14: Explanation on Assignments

(Each lectures will be held based on face-to-face, but it may be changed to on-demand depending on the situation.)

1: Introduction
2: Procedure of Seismic Evaluation
3: Seismic Index of Structure: IS
4: Irregularity and Time Indexes: SD and T
5: First Level Screening Procedure
6: Second Level Screening Procedure –Basic Seismic Index of Structure: E0–
7: Second Level Screening Procedure –Strength Index: C–
8: Second Level Screening Procedure –Ductility Index: F–
9: Judgment on Seismic Safety
10: Recent Earthquake Disasters
11: Introduction of Seismic Retrofit
12: Observation of Retrofitted Buildings
13: Observation of Structural Testing
14: Explanation on Assignments

(Each lectures will be held based on face-to-face, but it may be changed to on-demand depending on the situation.)

Self Preparation and Review

Related subjects

Notes for textbook

Standard for Seismic Evaluation of Existing Reinforced Concrete Buildings, 2001

Standard for Seismic Evaluation of Existing Reinforced Concrete Buildings, 2001

Notes for reference

Goals to be achieved

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

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

Evaluation of achievement

Report

- S 90 to 100
- A 80 to 89
- B 70 to 79
- C 60 to 69

Report

- S 90 to 100
- A 80 to 89
- B 70 to 79
- C 60 to 69

Examination

レポートで実施

By Report

Details of examination

Other information

Room：D-807

E-mail：matsui@ace.tut.ac.jp

Room：D-807

E-mail：matsui@ace.tut.ac.jp

Reference URL

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

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

Office hours

Wednesday 14:00-17:00

Wednesday 14:00-17:00

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Building Science: Indoor Air Quality and Ventilation[Building Science: Indoor Air Quality and Ventilation]				
Schedule number	M45630060	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Wed.4～4	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Architecture and Civil Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	島﨑　康弘, 田島　昌樹 SHIMAZAKI Yasuhiro, TAJIMA Masaki				
Numbering	ARC_MAS54125				

Objectives of class

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

This course aims at providing the practical strategies to realize a good building environment, mainly air quality and ventilation. The goal is to help professionals update their knowledge related to new techniques and methods on architectural environmental system and its control.

Contents of class

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

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

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。

The course is offered as an introduction to a professional-level understanding of indoor air quality control and ventilation method for realizing a better air environment and comfort in buildings. The course consists of the following topics:

1. Overview of indoor air environment (face-to-face)
2. Building related illness and indoor air quality (face-to-face)
3. Physical/chemical characteristics of air quality (face-to-face)
4. Measurement techniques of air pollutants (face-to-face)
5. Modeling of material emission and sorption (face-to-face)
6. Prediction method for indoor air quality (IAQ) in rooms (face-to-face)
7. CFD analysis of air movement (face-to-face)
8. Performance evaluation of ventilation systems (face-to-face)
9. Ventilation system design for pollutant control (face-to-face)
10. Guidelines, codes and standard on IAQ (face-to-face)
11. Current research and development on IAQ (1) (on-demand)
12. Current research and development on IAQ (2) (on-demand)

13. Current research and development on IAQ (3) (on-demand)
14. Discussion on IAQ related issues (1) (face-to-face)
15. Discussion on IAQ related issues (2) (face-to-face)

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
In order to enhance a learning effect, prepare for and review the lecture for around 90 minutes each.

Related subjects
Building science: Thermal Environment and vernacular architecture

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

Reference1	**Book title**	Environmental Science in Building			**ISBN**	9780230290808
	Author	Randall McMullan	**Publisher**	PALGRAVE MACMILLAN LTD	**Publish year**	2012

Notes for reference
特になし
N/A

Goals to be achieved
本コースは，シックビルディングシンドロームの背景と室内空気質を制御することによって良好な空気環境を実現するための実践的な手法を理解し，健康的で持続可能な建築を提示することを達成目標にする．さらに，関連する周辺領域の知見を広げる．
Achievement level of this course is to understand the background of sick building syndrome and the practical strategies to realize a good air environment by controlling indoor air quality and ventilation in buildings, and also propose the healthy and sustainable buildings. In addition, the knowledge of surrounding subjects will be established.

Evaluation of achievement
本科目に関連するレポートを課し，その達成度によって評価する。
Reports related to this subject are reviewed to evaluate the achievement level.

Examination
レポートで実施
By Report

Details of examination
特になし
N/A

Other information
特になし
N/A

Reference URL
特になし
N/A

Office hours
水曜日 13:00-15:00
Wed. 13:00-15:00, anytime upon request.

Relations to attainment objectives of learning and education

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

(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, 齊藤 大樹, 中澤 祥二, 三浦 均也, 松井 智哉, 松本 幸大, 松田 達也 5kei kyomu Iin-S, SAITOH Taiki, NAKAZAWA Shoji, MIURA Kinya, MATSUI Tomoya, MATSUMOTO Yukihiro, MATSUDA Tatsuya				
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, 田島 昌樹, 井上 隆信, 加藤 茂, 島崎 康弘, 横田 久里子, 東海林 孝幸 5kei kyomu Iin-S, TAJIMA Masaki, INOUE Takanobu, KATO Shigeru, SHIMAZAKI Yasuhiro, YOKOTA Kuriko, TOKAIRIN Takayuki				
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, 松島 史朗, 浅野 純一郎, 渋澤 博幸, 水谷 晃啓, 小野 悠, 杉木 直, 松尾 幸二郎 5kei kyomu Iin-S, MATSUSHIMA Shiro, ASANO Junichiro, SHIBUSAWA Hiroyuki, MIZUTANI Akihiro, ONO Haruka, SUGIKI Nao, MATSUO Kojiro				
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**	Tue.4～4	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Architecture and Civil Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	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

(M45630370)Advanced Urban Planning[Advanced Urban Planning]

Subject name[English]	Advanced Urban Planning[Advanced Urban Planning]				
Schedule number	M45630370	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Tue.1～1	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Architecture and Civil Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	浅野　純一郎, 小野　悠 ASANO Junichiro, ONO Haruka				
Numbering	ARC_MAS53025				

Objectives of class

都市計画や地域計画の基礎的知識に基づき、地区レベルの計画策定に係わる視点及び実践的知識と技能（デザイン技術を身につける。

This objectives of class are to understand and gain the viewpoint, practical knowledge and design skill on planning process at district plan matters, based on fundamental knowledge of urban and regional planning.

Contents of class

1)ガイダンス
2）～8）第 1 課題（浅野担当）
9）～15）第 2 課題（小野担当）
各々の課題は、
基礎的文献の収集（1～2 回）
対象地域の課題検討、問題整理（2～3 回）
計画立案（1～2 回）
成果発表（1 回）
等で構成される。
1st week: class guidance
2nd-8th: first topic by professor Asano
9th-15th: second topic by associate professor Ono
each topic composed the following contents, for example, as
data and documents collection:one or two weeks:
investigation and interpretation about planning problem in target area (including temporary presentation):two or three weeks
planning working::one or two weeks:
final presentation:one week

Self Preparation and Review

Related subjects

地区計画、都市地域計画、地区計画・同演習、空間情報演習
district planning, urban and regional planning, spatial information planning

Notes for textbook

教科書：講義時に資料配布

original texts will be delivered in the class.

Reference1	**Book title**	toshikeikaku manual			**ISBN**	
	Author	city planning institute of japan	**Publisher**	maruzen	**Publish year**	
Reference2	**Book title**	都市計画マニュアル			**ISBN**	
	Author	日本都市計画学会	**Publisher**	丸善	**Publish year**	
Reference3	**Book title**	kenchiku sekkei shiryo syusei			**ISBN**	
	Author	architectural institue of japan	**Publisher**	maruzen	**Publish year**	
Reference4	**Book title**	建築設計資料集成			**ISBN**	

	Author	日本建築学会	Publisher	丸善	Publish year	

Notes for reference

Goals to be achieved

・地区レベルの計画立案プロセスが理解できること
・課題テーマによる対象地域の計画課題が特定できること
・課題テーマによる計画課題に対して、対策が立案できること
・地区計画に関わるデザインができること
1. to be able to understand planning process at district scale planning
2. to be able to specify planning problems in the target area along workshop topic
3. to be able to make the countermeasure against the above planning problem
4. to be able to design as district scale planning

Evaluation of achievement

課題に対する成果物によって評価する。
the result of case study report(100 points)
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

レポートで実施
By Report

Details of examination

Other information

D-708、6836、asano@ace.tut.ac.jp
professor Asano:D-708, PHONE44-6836, asano@ace.tut.ac.jp
lecturer Ono:D-704 ono@ace.tut.ac.jp

Reference URL

http://urbandesign.web.fc2.com/MOTHER-hp/STU-hp/index.html
professor ASANO : http://urbandesign.web.fc2.com/MOTHER-hp/STU-hp/index.html

Office hours

毎週木曜の 12:00-13:00
office hour:Tuesdays from 12:30-13:30

Relations to attainment objectives of learning and education

本科目は以下の「大学院キャリアアッププログラム」に該当する.
（建築コース）
建築デザイナー, 都市・地域プランナー
（社会基盤コース）
都市・地域プランナー

本科目は以下の「建築士試験の大学院における実務訓練」に該当する.
建築士試験指定科目　関連科目（演習・実験・実習）

Key words

地区　都市デザイン　土地利用　景観整備
district scale, urban design, land use, landscape preservation

(M45630380)Advanced Architectural Design[Advanced Architectural Design]

Subject name[English]	Advanced Architectural Design[Advanced Architectural Design]				
Schedule number	M45630380	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Tue.2～2	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Architecture and Civil Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	水谷　晃啓 MIZUTANI Akihiro				
Numbering	ARC_MAS53225				

Objectives of class

Advanced Architectural Design is a kind of digital design studio. Learn the necessary knowledge and design techniques in designing and planning public buildings and spaces through case studies and design works. Therefore, this class is appropriate for students who have studied architectural design.

Contents of class

1. Guidance, "What is architectural design?"
2. A requirement for designing public facilities and public spaces 1
3. A requirement for designing public facilities and public spaces 2
4. What are the knowledge and design techniques necessary for designing public facilities and public spaces?
5. Workshop 1 for learning design technology (basic)
6. Workshop 2 for learning design technology (basic)
7. Workshop 3 for learning design technology (basic)
8. Workshop 4 for learning design technology (application)
9. Workshop 5 for learning design technology (application)
10. Workshop 6 for learning design technology (application)
11. Design and planning of public facilities and spaces 1 (Survey)
12. Design and planning of public facilities and spaces 2 (Design work)
13. Design and planning of public facilities and spaces 3 (design work)
14. Design and planning of public facilities and spaces 4 (Proposal)
15. Summary

Self Preparation and Review

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

Related subjects

N／A

Notes for textbook

N／A

Notes for reference

Please refer them(sorry, Japanese only).

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

Goals to be achieved

To master design technology for designing and planning public buildings and social infrastructure facilities.

Evaluation of achievement

The grades will be evaluated by comprehensive consideration based on discussion (30%) and reports (70%) in the course.

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

Other information
Reference URL
Office hours
Relations to attainment objectives of learning and education
Key words

(M45630390)Advanced Computational and Environmental Economics[Advanced Computational and Environmental Economics]

Subject name[English]	Advanced Computational and Environmental Economics[Advanced Computational and Environmental Economics]				
Schedule number	M45630390	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Fri.4～4	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Architecture and Civil Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	渋澤 博幸 SHIBUSAWA Hiroyuki				
Numbering	ARC_MAS55025				

Objectives of class

In this course, students learn the economic modeling techniques and the simulation methodology.

In this course, students learn the economic modeling techniques and the simulation methodology.

Contents of class

1-2: Input-Output Model
3-4: Simple 2 Sectors General Equilibrium Model
5-6: Inter-Sectoral General Equilibrium Model
7-8: Simulation and Numerical Example
9-11: Open Model with Exports and Imports
12-13: General Equilibrium Model with Public Sector
14-15: Simulation and Numerical Example

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.

1-2: Input-Output Model
3-4: Simple 2 Sectors General Equilibrium Model
5-6: Inter-Sectoral General Equilibrium Model
7-8: Simulation and Numerical Example
9-11: Open Model with Exports and Imports
12-13: General Equilibrium Model with Public Sector
14-15: Simulation and Numerical Example

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

Required Assignments
Students are required to learn topics and exercises before and after each class.

Required Assignments
Students are required to learn topics and exercises before and after each class.

Related subjects

Macro Economic, Micro Economics, Spatial Economic System Analysis

Macro Economic, Micro Economics, Spatial Economic System Analysis

Notes for textbook

Papers will be distributed.

Papers will be distributed.

Notes for reference

Goals to be achieved

Acquiring the theory of the general equilibrium model.

Constructing a general equilibration model using an numerical data.
Evaluating impacts of an economic polity using the general equilibrium model.
Acquiring the theory of the general equilibrium model.
Constructing a general equilibration model using an numerical data.
Evaluating impacts of an economic polity using the general equilibrium model.

Evaluation of achievement

Reports must be submitted. Report 100%.
S:90 Points or higher A: 80 Points or higher, B: 70 points or higher, C:60 points or higher, D: Less than 60 points

Reports must be submitted. Report 100%.
S:90 Points or higher A: 80 Points or higher, B: 70 points or higher, C:60 points or higher, D: Less than 60 points

Examination

レポートで実施
By Report

Details of examination

N/A

Other information

N/A

Reference URL

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

Office hours

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

Relations to attainment objectives of learning and education

Key words

Computational Economics, Simulation
Computational Economics, Simulation

(M45630410)Advanced Transportation and Urban Planning[Advanced Transportation and Urban Planning]

Subject name[English]	Advanced Transportation and Urban Planning[Advanced Transportation and Urban Planning]				
Schedule number	M45630410	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Fri.2～2	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～
Department Offered	Architecture and Civil Engineering			**Beggining grade**	M1
Charge teacher name[Roman alphabet mark]	杉木　直 SUGIKI Nao				
Numbering	ARC_MAS53325				

Objectives of class

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

Contents of class

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

Self Preparation and Review

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

Related subjects

Advanced Transportation Engineering
Advanced Transportation System and Transport Economics

Notes for textbook

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

Notes for reference

N/A

Goals to be achieved

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

Evaluation of achievement

Evaluation of achievement: The academic score of each student is evaluated by reports (100%).
Criteria of evaluation: Score S is 90 or higher, score A is 80 or higher to lower than 90, score B is 70 or higher to lower than 80, score C is 60 or higher to lower than 70.

Examination

レポートで実施
By Report

Details of examination

N/A

Other information

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

Reference URL

N. Sugiki： https://sites.google.com/tr.ace.tut.ac.jp/home/en

Office hours

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

Relations to attainment objectives of learning and education

Key words

Transportation system, Urban Planning, Urban structure, Simulation model, Evaluation method, 実務経験
Transportation system, Urban Planning, Urban structure, Simulation model, Evaluation method