

Syllabus

**International Master' s Degree
Program
(2020-Spring Term)**

(M40030010)Management Science[Management Science]

Subject name[English]	Management Science[Management Science]				
Schedule number	M40030010	Subject area	General courses	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Thu.1~1	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering, Architecture and Civil Engineering, Electrical and Electronic Information Engineering, Computer Science and Engineering, Applied Chemistry and Life Science			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	藤原 孝男 FUJIWARA Takao				
Numbering	GEN_LIB52325				
Objectives of class					
<p>社会経済を分析する能力を身に付ける。 本講義では、経営管理の観点から企業価値や資本コストを意識した経営の発想や手法についてファイナンスの基本を学ぶ。 授業形態として、英語コースの授業を兼ねるため、言語は英語主体で行われる。 Study objective is to learn an analytical capability on social and managerial perspectives. This class introduces basic finance knowledge to understand the managerial idea and the tool for the company value and capital cost. Teaching language is mainly dependent on English.</p>					
Contents of class					
<p>授業内容では、確率の基礎、金利、そして裁定取引の考えを基に、デリバティブの中のオプションの価格設定に関わる基本的発想を説明する。 主なトピックとしては、 第1週：確率の基礎、 第2週：正規確率変数、 第3週：幾何ブラウン運動、 第4週：金利、 第5週：裁定取引、 第6~7週：ブラック・ショールズ方程式、 第8~10週：BS式の付随項目(配当・ジャンプ・リスクパラメータ推定)、 第11週：期待効用による価値評価、 第12週：確率的次数、 第13週：最適化モデル、 第14週：確率動的計画法、 第15週：エキゾテックオプション、 第16週：期末試験、 などを予定している。 The class will discuss about basic ideas on the valuation of financial option as a derivative based on the elementary probability, interest rate, and arbitrage theory. Class content will include following topics: #1: baic probability, #2: normal random variable, #3: geometric Brownian motion, #4: interest rates, #5: arbitrage trade, #6-7: Black Scholes formula, #8-10: additional items; dividend, jump, and volatility estimation, #11: valuation by expected utility, #12: stochastic order, #13: optimization model, #14: group exercises about business plan, #15: group exercises about business presentation, #16: semester examination.</p>					
Self Preparation and Review					
Teaching materials will be uploaded at moodle. Attending students are expected to complete pre- and re-views, investigate by themselves, and ask the lecturer.					
Related subjects					

経営学(学部 1 年), 生産管理論, リアルオプション, ゲーム理論, MOT
 Management (undergraduate), Operations Management, Real Options, Game Theory, MOT, Entrepreneurship, Innovation
 Management.

Notes for textbook

As noted above, materials will be uploaded at moodle.

As noted above, materials will be uploaded at moodle.

Reference1	Book title	An Elementary Introduction to Mathematical Finance (3rd.ed.)		ISBN	978-0-521- 19253-8
	Author	Sheldon M. Ross	Publisher	Cambridge University Press	Publish year

Notes for reference

N/A

N/A

Goals to be achieved

- 1) 正規確率変数の意味を理解できること
 - 2) ブラック・ショールズ方程式の基本的構造が理解できること
 - 3) ヨーロピアン・コールオプションの価格評価手法について理解できること
- 1) To understand the meaning of normal random variable.
 - 2) To comprehend the basic model structure of Black Scholes formula.
 - 3) To value an European call option as a financial derivative.

Evaluation of achievement

評価方法:

期末試験 60%, レポート 20%, プレゼン 20%の配分で総合的に評価する予定である。

評価基準:

学部・博士前期課程

S: 達成目標を全て達成しており, 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

Evaluation Style:

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

Evaluation Criteria:

Bachelor , Master student

S: If students achieved every above goals and their summed scores are equal or more than 90 (the maxim scores 100).

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

B: If students achieved at least 70% of above goals and their summed scores are equal or more than 70 (the maxim scores 100).

C: If students achieved at least 60% of above goals and their summed scores are equal or more than 60 (the maxim scores 100).

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

N/A

N/A

Office hours

随時応じる

At any time if available.

Relations to attainment objectives of learning and education

(B) 技術者・研究者としての正しい倫理観と社会性
上級技術者・研究者として社会的・倫理的責任を有し、社会における技術的課題を設定・解決・評価する能力を身につけている。

(B) 技術者・研究者としての正しい倫理観と社会性
上級技術者・研究者として社会的・倫理的責任を有し、社会における技術的課題を設定・解決・評価する能力を身につけている。

(B) 技術者・研究者としての正しい倫理観と社会性
上級技術者・研究者として社会的・倫理的責任を有し、社会における技術的課題を設定・解決・評価する能力を身につけている。

(B) 技術者・研究者としての正しい倫理観と社会性
上級技術者・研究者として社会的・倫理的責任を有し、社会における技術的課題を設定・解決・評価する能力を身につけている。

(B) 技術者・研究者としての正しい倫理観と社会性
上級技術者・研究者として社会的・倫理的責任を有し、社会における技術的課題を設定・解決・評価する能力を身につけている。

(B) Sound ethics and social awareness as advanced-level engineers and researchers
Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; and have the ability to set, solve and evaluate technical issues in society

(B) Sound ethics and social awareness as advanced-level engineers and researchers
Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technical issues in society

(B) Sound ethics and social awareness as advanced-level engineers and researchers
Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; and have the ability to set, solve and evaluate technical issues in society

(B) Sound ethics and social awareness as advanced-level engineers and researchers
Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; and have the ability to set, solve and evaluate technical issues in society

(B) Sound ethics and social awareness as advanced-level engineers and researchers
Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; and have the ability to set, solve and evaluate technical issues in society

Key words

リアル・オプション, ゲーム理論, 生産管理論, アントレプレナーシップ

Real Options, Game Theory, Operations Management, Management, Entrepreneurship

(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総合一教務委員,穂積 直裕,大門 裕之, Lim Pang Boey, 小池 誠一,岡田 浩,岩佐 精二,畑山 要介,高嶋 孝明,蔡 万里,中村 大介,武藤 浩行,藤原 孝男,和泉 司,加藤 三保子,齊藤 大樹 Sougou kyoiku kyomu Iin, HOZUMI Naohiro, DAIMON Hiroyuki, Lim Pang Boey, KOIKE Seiichi, OKADA Hiroshi, IWASA Seiji, HATAYAMA Yosuke, TAKASHIMA Takaaki, SAI Banri, NAKAMURA Daisuke, MUTO Hiroyuki, FUJIWARA Takao, IZUMI Tsukasa, KATOH Mihoko, SAITOH Taiki				
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. Hozumi "Japan's Modernization Supported by Electric Power" Japan's modernization started in the middle of 19 th centry when a long period of isolation policy has been terminated. Her repid growth until now has been strongly supported by electric power. Now Japan's power supply is recognized as the best quality in the world. In the lecture, history and state of the art of Japan's electric power will be presented.					
2. Daimon "Working in Japanese Company" Learn and discuss about working in Japanese company and what you should do for it.					
3. Lim Pang Boey "Japanese Education System" Learn about the Japanese education system and what the life of a student is like in Japan?					
4. Koike "Introduction to International Cooperation Policy (View of Japanese Official Development Assistance)" This course introduces International Aid Policies and traces their history. Through the lecture students understand signatures of Japanese Official Development Assistance (ODA) and consider the concept of "Human Security" as one of Japanese Aid philosophies.					
5.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.					
6. Iwasa "The Range of Organic Chemistry" I will give a talk on the following subjects as one of scene of science and technology in Japan: ◆Organic Chemistry in Environment —Amazing Natural Products— ◆Development of Life Environment —Molecular Sensor as an Basic Technology in all of Science— ◆New Horizon of Catalytic Asymmetric Synthesis —C1 Asymmetric Catalyst—					
7.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.					
8.Takashima "A global company doing business in Japan" IBM, a global enterprise, is running business in Japan more than 75 years. A history and transformation of IBM' s business in Japan are introduced. A comparative analysis of IBM with TOYOTA is provided to see and think about the differences. An insight that the lecturer got from the experience of working in IBM for 32 years is also shared.					

9.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.

10.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.

11. Muto “Fine Ceramics”

Fine Ceramics (also known as “advanced ceramics”) are used to make components that require high levels of performance and reliability, such as advanced electronic devices and so on. In fact, Fine Ceramics support the latest technologies in diverse applications throughout modern society.

In this class, students will learn about “manufacture (Mono-zukuri)” in Japan.

12. Fujiwara “Japaneses-style Business Management”

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

13.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.

14. Kato “Sign Language Writing System for the deaf”

Sign language for the deaf is a visual-manual language and has some characteristics different from those of aural-oral language. In this class, we will overview linguistic aspects of sign language. After studying some notation systems for sign languages, we will discuss the necessity to employ “writing system” of sign languages to describe a sign or a signed sentence for everyday purposes.

15.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.

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					
This is a Basic Japanese conversation class. You will learn elementary Japanese grammar and vocabulary to speak Japanese on campus.					
Contents of class					
オンライン上(Google Meet)で授業を行います。					
日本語初級の教科書「はかせ」を使います。					
<ol style="list-style-type: none"> 1. 発音 2. L.1 3. L.2 4. L.3 5. L.4 6. L.5 7. L.6 8. L.7 9. L.8 10. L.9 11. L.10 12. L.11 13. L.12 14. L.13 					
Remote simultaneous interactive(You can talk interactively with the lecture over the Internet at a set time.)					
Students will learn the following lessons in Japanese textbook “ Basic Japanese for Students Hakase1”.					
<ol style="list-style-type: none"> 1. Pronunciation of Japanese 2. Lesson 1 Hajimemashite. Watashi wa Heren desu. 3. Lesson 2 O-kuni wa dochira desuka. 4. Lesson 3 Sore wa nan desuka. 5. Lesson 4 Watashi wa asa koohii o nomimasu. 6. Lesson 5 Ima nan-ji desuka. 7. Lesson 6 Ashita doko e ikimasu ka. 8. Lesson 7 Juu-gatsu juu-go-nichi ni Nihon e kimashita. & Active learning 9. Lesson 8 Kyooshitsu ni dare ga imasu ka. & Active learning 10. Lesson 9 Yuubinkyoku wa doko ni arimasu ka. & Active learning 11. Lesson 10 Nihon e robotto no kenkyuu ni kimashita. & Active learning 12. Lesson 11 Fuji-san wa kireina yama desu. & Active learning 13. Lesson 12 Ryokoo wa doo deshita ka. & Active learning 14. Lesson 13 Shuumatsu ni nani oshitai desu ka. & Active learning 					
Self Preparation and Review					
語彙, Notes を予習しておいてください。					

毎回復習として「Structures」を覚えてください。

Preparation: Please read Vocabulary and Notes in each lesson.

Review: Please memorize "Structures" after each lesson.

Related subjects

Basic Japanese Classes(にほんごほこう)

Basic Japanese Classes (Nihongo Hokoo)

For more information, please see the following URL: <http://ignite.tut.ac.jp/cir/students/program/hokou.html>

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

Notes for textbook

¥2,000(税抜き)

¥2,000(+tax)

Notes for reference

特になし

N/A

Goals to be achieved

1) 日本語初級の文型を理解することができる。

2) やさしい日本語を使って日本人とコミュニケーションができる。

1) You will be able to understand basic Japanese structures and grammatical items.

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

Evaluation of achievement

宿題と練習60%, 期末課題40%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 60%, Term report/assignment 40%

Evaluation criteria:

Students who attend all classes will be evaluated as follows:

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

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

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

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

Examination

定期試験を実施(対面)

Examination(Face to Face)

Details of examination

特になし

N/A

Other information

特になし

N/A

Reference URL

特になし

N/A

Office hours

火曜日 13:00-13:30

Tuesday 13:00-13:30

Relations to attainment objectives of learning and education

機械工学専攻

(D) グローバルに活躍できるコミュニケーション力

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

ケーション力を身につけている。

電気・電子情報工学専攻

(D)グローバルに活躍できるコミュニケーション力

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

情報・知能工学専攻

(D)グローバルに活躍できるコミュニケーション力

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

応用化学・生命工学専攻

(D)グローバルに活躍できるコミュニケーション力

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

建築・都市システム学専攻

(D)グローバルに活躍できるコミュニケーション力

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

Graduate Program of Mechanical Engineering for Master's Degree

(D) Communication skills for global success

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

Graduate Program of Electrical and Electronic Information Engineering for Master's Degree

(D) Communication skills for global success

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

Graduate Program of Computer Science and Engineering for Master's Degree

(D) Communication skills for global success

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

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

(D) Communication skills for global success

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

Graduate Program of Architecture and Civil Engineering for Master's Degree

(D) Communication skills for global success

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

Key words

Basic Japanese

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

Subject name[English]	Seminar on Mechanical Engineering I[Seminar on Mechanical Engineering I]				
Schedule number	M41610010	Subject area	Advanced Mechanical Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	4
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS51015				
Objectives of class	<p>The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.</p> <p>The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.</p>				
Contents of class	<p>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.</p> <p>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.</p>				
Self Preparation and Review	<p>Different in each laboratory</p> <p>Different in each laboratory</p>				
Related subjects	<p>Different in each laboratory</p> <p>Different in each laboratory</p>				
Notes for textbook	<p>Different in each laboratory</p> <p>Different in each laboratory</p>				
Notes for reference	<p>N/A</p> <p>N/A</p>				
Goals to be achieved	<p>To acquire fundamental knowledge of individual research fields.</p> <p>To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.</p> <p>To acquire fundamental knowledge of individual research fields.</p> <p>To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.</p>				
Evaluation of achievement	<p>Holding meetings to report tasks for each laboratory and comprehensively evaluating the results including contents, materials and attitudes.</p> <p>Grade levels are C(60% - less than 70%), B(70- less than 80%), A(80% - less than 90 %) and S(90% or over).</p> <p>Holding meetings to report tasks for each laboratory and comprehensively evaluating the results including contents, materials and attitudes.</p> <p>Grade levels are C(60% - less than 70%), B(70- less than 80%), A(80% - less than 90 %) and S(90% or over).</p>				
Examination	<p>試験期間中には何も行わない</p> <p>None during exam period</p>				
Details of examination	<p>N/A</p> <p>N/A</p>				
Other information	<p>N/A</p> <p>N/A</p>				
Reference URL					

Different in each laboratory

Different in each laboratory

Office hours

Different in each laboratory

Different in each laboratory

Relations to attainment objectives of learning and education

(C) 高度な知識を統合的に活用できる実践力・創造力

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

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

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

(D) グローバルに活躍できるコミュニケーション力

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

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

(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 for problem 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 into practice; and to create new technologies to solve problems

(D) Communication skills for global success

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

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

Key words

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

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

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

Subject name[English]	Seminar on Mechanical Engineering II[Seminar on Mechanical Engineering II]				
Schedule number	M41610020	Subject area	Advanced Mechanical Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Mechanical Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS61015				
Objectives of class	<p>The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.</p> <p>The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.</p>				
Contents of class	<p>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.</p> <p>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.</p>				
Self Preparation and Review	<p>Given by supervisors.</p> <p>Given by supervisors.</p>				
Related subjects	<p>N/A</p> <p>N/A</p>				
Notes for textbook	<p>Given by supervisors.</p> <p>Given by supervisors.</p>				
Notes for reference	<p>N/A</p> <p>N/A</p>				
Goals to be achieved	<p>To acquire fundamental knowledge of individual research fields.</p> <p>To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.</p> <p>To acquire fundamental knowledge of individual research fields.</p> <p>To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.</p>				
Evaluation of achievement	<p>Evaluated comprehensively by content, reports, considerations, etc. of presentation in each laboratory.</p> <p>Grade levels are C(60% - less than 70%), B(70% - less than 80%), A(80% - less than 90%) and S(90% or over).</p> <p>Evaluated comprehensively by content, reports, considerations, etc. of presentation in each laboratory.</p> <p>Grade levels are C(60% - less than 70%), B(70% - less than 80%), A(80% - less than 90%) and S(90% or over).</p>				
Examination	<p>試験期間中には何も行わない</p> <p>None during exam period</p>				
Details of examination	<p>N/A</p> <p>N/A</p>				
Other information	<p>For any questions, contact your supervisor.</p> <p>For any questions, contact your supervisor.</p>				

Reference URL

N/A

N/A

Office hours

Contact your supervisor.

Contact your supervisor.

Relations to attainment objectives of learning and education

(C) 高度な知識を統合的に活用できる実践力・創造力

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

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

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

(D) グローバルに活躍できるコミュニケーション力

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

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

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

(E) 最新の技術や社会環境の変化に対する探究心と持続的学習力

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

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

Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge for problem 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 into practice; and to create new technologies to solve problems

(D) Communication skills for global success

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

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

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

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

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

Key words

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

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

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

Subject name[English]	Thesis Research on Mechanical Engineering[Thesis Research on Mechanical Engineering]				
Schedule number	M41610030	Subject area	Advanced Mechanical Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~1
Department Offered	Mechanical Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S1系教務委員, 1系各教員 1kei kyomu iin-S, 1kei kakukyouin				
Numbering	MEC_MAS61015				
Objectives of class	The thesis research aims to provide a practical experience of research work, and to acquire research skills with a deep understanding of relevant knowledge.				
Contents of class	The research subject depends on the supervisor and the research group you join. Individual students will have different research subjects. Discuss with your supervisor.				
Self Preparation and Review					
Related subjects					
Notes for textbook	Reference and material will be available from the supervisor.				
Notes for reference					
Goals to be achieved	To get something new on individual research fields. To develop your research skills including planning and presentation skills.				
Evaluation of achievement					
Examination	試験期間中には何も行わない None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Thesis Research on Mechanical Engineering[Thesis Research on Mechanical Engineering]				
Schedule number	M41610030	Subject area	Advanced Mechanical Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S1系教務委員, 1系各教員 1kei kyomu iin-S, 1kei kakukyouin				
Numbering	MEC_MAS61015				
Objectives of class	<p>A research work of an unresolved engineering problem must be carried out in addition to class to become a leading engineer having creative and applied abilities that is education philosophy of department of mechanical engineering. Through carrying out the supervised research, active studying and researching are developed. By actively studying and researching, the research is developed furthermore. Finally, abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's in the process of the research work.</p> <p>A research work of an unresolved engineering problem must be carried out in addition to class to become a leading engineer having creative and applied abilities that is education philosophy of department of mechanical engineering. Through carrying out the supervised research, active studying and researching are developed. By actively studying and researching, the research is developed furthermore. Finally, abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's in the process of the research work.</p>				
Contents of class	<p>Follow instruction of supervisors. Follow instruction of supervisors.</p>				
Self Preparation and Review	<p>Follow instruction of supervisors. Follow instruction of supervisors.</p>				
Related subjects	<p>The work is related to every classes which has been studied in graduate and undergraduate schools. The work is related to every classes which has been studied in graduate and undergraduate schools.</p>				
Notes for textbook	<p>N/A N/A</p>				
Notes for reference	<p>N/A N/A</p>				
Goals to be achieved	<p>Abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's ones in the process of the research work.</p> <p>Abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's ones in the process of the research work.</p>				
Evaluation of achievement	<p>Research work, tangible results, presentation and oral examination in presentation of master theses, etc. are evaluated comprehensively out of a hundred. Grade levels are C(60% - less than 70%), B(70- less than 80%), A(80% - less than 90 %) and S(90% or over). Research work, tangible results, presentation and oral examination in presentation of master theses, etc. are evaluated comprehensively out of a hundred. Grade levels are C(60% - less than 70%), B(70- less than 80%), A(80% - less than 90 %) and S(90% or over).</p>				
Examination	<p>試験期間中には何も行わない None during exam period</p>				
Details of examination					

None during exam period

None during exam period

Other information

For any questions, contact your supervisor.

For any questions, contact your supervisor.

Reference URL

N/A

N/A

Office hours

Contact your supervisor.

Contact your supervisor.

Relations to attainment objectives of learning and education

(C) 高度な知識を統合的に活用できる実践力・創造力

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

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

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

(D) グローバルに活躍できるコミュニケーション力

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

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

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

(E) 最新の技術や社会環境の変化に対する探究心と持続的学習力

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

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

Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge for problem 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 into practice; and to create new technologies to solve problems

(D) Communication skills for global success

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

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

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

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

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

Key words

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

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

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

Subject name[English]	Thesis Research on Mechanical Engineering[Thesis Research on Mechanical Engineering]				
Schedule number	M4161003T	Subject area	Advanced Mechanical Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Mechanical Engineering			Begging grade	M2
Charge teacher name[Roman alphabet mark]	S1系教務委員, 1系各教員 1kei kyomu iin-S, 1kei kakukyouin				
Numbering	MEC_MAS61015				
Objectives of class					
<p>A research work of an unresolved engineering problem must be carried out in addition to class to become a leading engineer having creative and applied abilities that is education philosophy of department of mechanical engineering. Through carrying out the supervised research, active studying and researching are developed. By actively studying and researching, the research is developed furthermore. Finally, abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's in the process of the research work.</p> <p>A research work of an unresolved engineering problem must be carried out in addition to class to become a leading engineer having creative and applied abilities that is education philosophy of department of mechanical engineering. Through carrying out the supervised research, active studying and researching are developed. By actively studying and researching, the research is developed furthermore. Finally, abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's in the process of the research work.</p>					
Contents of class					
<p>Follow instruction of supervisors.</p> <p>Follow instruction of supervisors.</p>					
Self Preparation and Review					
<p>Follow instruction of supervisors.</p> <p>Follow instruction of supervisors.</p>					
Related subjects					
<p>The work is related to every classes which has been studied in graduate and undergraduate schools.</p> <p>The work is related to every classes which has been studied in graduate and undergraduate schools.</p>					
Notes for textbook					
<p>N/A</p> <p>N/A</p>					
Notes for reference					
<p>N/A</p> <p>N/A</p>					
Goals to be achieved					
<p>Abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's ones in the process of the research work.</p> <p>Abilities of problem-consciousness, problem-solving, problem-questing, planning, creativity, judgement, responsibility, toughness, cooperativeness, presentation, and ethics are polished up at a higher level than undergraduate's ones in the process of the research work.</p>					
Evaluation of achievement					
<p>Research work, tangible results, presentation and oral examination in presentation of master theses, etc. are evaluated comprehensively out of a hundred.</p> <p>Grade levels are C(60% - less than 70%), B(70- less than 80%), A(80% - less than 90 %) and S(90% or over).</p> <p>Research work, tangible results, presentation and oral examination in presentation of master theses, etc. are evaluated comprehensively out of a hundred.</p> <p>Grade levels are C(60% - less than 70%), B(70- less than 80%), A(80% - less than 90 %) and S(90% or over).</p>					
Examination					
<p>試験期間中には何も行わない</p> <p>None during exam period</p>					
Details of examination					

None during exam period

None during exam period

Other information

For any questions, contact your supervisor.

For any questions, contact your supervisor.

Reference URL

N/A

N/A

Office hours

Contact your supervisor.

Contact your supervisor.

Relations to attainment objectives of learning and education

(C) 高度な知識を統合的に活用できる実践力・創造力

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

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

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

(D) グローバルに活躍できるコミュニケーション力

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

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

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

(E) 最新の技術や社会環境の変化に対する探究心と持続的学習力

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

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

Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge for problem 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 into practice; and to create new technologies to solve problems

(D) Communication skills for global success

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

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

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

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

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

Key words

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

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

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

Subject name[English]	Seminar on Mechanical Engineering[Seminar on Mechanical Engineering]				
Schedule number	M41610040	Subject area	Advanced Mechanical Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Mechanical Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS51015				
Objectives of class					
The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.					
The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.					
Contents of class					
The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.					
The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.					
Self Preparation and Review					
Given by supervisors.					
Given by supervisors.					
Related subjects					
N/A					
N/A					
Notes for textbook					
Given by supervisors.					
Given by supervisors.					
Notes for reference					
N/A					
N/A					
Goals to be achieved					
To acquire fundamental knowledge of individual research fields.					
To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.					
To acquire fundamental knowledge of individual research fields.					
To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.					
Evaluation of achievement					
Evaluated comprehensively by content, reports, considerations, etc. of presentation in each laboratory.					
Grade levels are C(60% - less than 70%), B(70% - less than 80%), A(80% - less than 90%) and S(90% or over).					
Evaluated comprehensively by content, reports, considerations, etc. of presentation in each laboratory.					
Grade levels are C(60% - less than 70%), B(70% - less than 80%), A(80% - less than 90%) and S(90% or over).					
Examination					
試験期間中には何も行わない					
None during exam period					
Details of examination					
N/A					
N/A					
Other information					
For any questions, contact your supervisor.					
For any questions, contact your supervisor.					

Reference URL

N/A

N/A

Office hours

Contact your supervisor.

Contact your supervisor.

Relations to attainment objectives of learning and education

(C) 高度な知識を統合的に活用できる実践力・創造力

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

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

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

(D) グローバルに活躍できるコミュニケーション力

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

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

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

(E) 最新の技術や社会環境の変化に対する探究心と持続的学習力

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

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

Have advanced knowledge about mechanical engineering and related fields and have the practical and creative skills to utilize such knowledge for problem 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 into practice; and to create new technologies to solve problems

(D) Communication skills for global success

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

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

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

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

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

Key words

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

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

(M41610050)Internship[Internship]

Subject name[English]	Internship[Internship]				
Schedule number	M41610050	Subject area	Advanced Mechanical Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	0
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Mechanical Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS51015				
Objectives of class					
Students are expected to address problems in a specialized field in a company or research institute. The objectives of this subject are to experience practical research and development and to cultivate the practical problem-solving ability, planning ability, and creativity.					
Students are expected to address problems in a specialized field in a company or research institute. The objectives of this subject are to experience practical research and development and to cultivate the practical problem-solving ability, planning ability, and creativity.					
Contents of class					
In order to cultivate the practical problem-solving ability, academic and company/institutional supervisors will provide practical problems in a specialized field through close communication.					
In order to cultivate the practical problem-solving ability, academic and company/institutional supervisors will provide practical problems in a specialized field through close communication.					
Self Preparation and Review					
Students are expected to discuss a preferable internship topic with supervisors before starting it.					
Students are expected to discuss a preferable internship topic with supervisors before starting it.					
Related subjects					
N/A					
N/A					
Notes for textbook					
Follow instructions provided by company/institutional supervisors.					
Follow instructions provided by company/institutional supervisors.					
Notes for reference					
N/A					
N/A					
Goals to be achieved					
While engaging practical activities in a company or research institution for several months, students are expected to improve the practical problem-solving ability, planning ability, and creativity as well as an international way of thinking.					
While engaging practical activities in a company or research institution for several months, students are expected to improve the practical problem-solving ability, planning ability, and creativity as well as an international way of thinking.					
Evaluation of achievement					
Comprehensive evaluation based on students' reports and evaluation sheets by academic and company/institutional supervisors.					
A: 80 or higher (out of 100 points), B: 65 or higher (out of 100 points) C: 55 or higher (out of 100 points)					
Comprehensive evaluation based on students' reports and evaluation sheets by academic and company/institutional supervisors.					
A: 80 or higher (out of 100 points), B: 65 or higher (out of 100 points) C: 55 or higher (out of 100 points)					
Examination					
試験期間中には何も行わない					
None during exam period					
Details of examination					
N/A					
N/A					
Other information					
N/A					
N/A					
Reference URL					

N/A

N/A

Office hours

N/A

N/A

Relations to attainment objectives of learning and education

(D) グローバルに活躍できるコミュニケーション力

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

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

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

(D) Communication skills for global success

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

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

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

Key words

Internship

Internship

(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 Ikei kyomu Iin-S				
Numbering	MEC_MAS53025				
Objectives of class					
This lecture aims to provide a broad understanding of the mechanical systems design available for the master thesis research work of a student.					
This lecture aims to provide a broad understanding of the mechanical systems design available for the master thesis research work of a student.					
Contents of class					
The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.					
The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.					
Self Preparation and Review					
Follow instruction of supervisors.					
Follow instruction of supervisors.					
Related subjects					
Follow instruction of supervisors.					
Follow instruction of supervisors.					
Notes for textbook					
Textbook or material will be made available from the supervisors.					
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

機械工学専攻

(C) 高度な知識を統合的に活用できる実践力・創造力

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

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

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

(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 for problem 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 into practice; and to create new technologies to solve problems

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 for problem 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 into practice; and to create new technologies to solve problems

Key words

mechanical system design

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

Subject name[English]	Advanced Materials and Manufacturing Process II[Advanced Materials and Manufacturing Process II]				
Schedule number	M41630240	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Tue.4~4	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS54025				
Objectives of class					
This lecture aims to provide a broad understanding of the materials and manufacturing process available for the master thesis research work of a student.					
This lecture aims to provide a broad understanding of the materials and manufacturing process available for the master thesis research work of a student.					
Contents of class					
The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.					
The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.					
Self Preparation and Review					
Follow instruction of supervisors.					
Follow instruction of supervisors.					
Related subjects					
Follow instruction of supervisors.					
Follow instruction of supervisors.					
Notes for textbook					
Textbook or material will be made available from the supervisors.					
Textbook or material will be made available from the supervisors.					
Notes for reference					
N/A					
N/A					
Goals to be achieved					
To acquire fundamental knowledge of individual research fields.					
To acquire the ability to find problems, the ability to solve the problems and the presentation skill.					
To acquire fundamental knowledge of individual research fields.					
To acquire the ability to find problems, the ability to solve the problems and the presentation skill.					
Evaluation of achievement					
Coursework, presentation and/or report.					
Grade levels are C(60% - less than 70%), B(70- less than 80%), A(80% - less than 90 %) and S(90% or over).					
Coursework, presentation and/or report.					
Grade levels are C(60% - less than 70%), B(70- less than 80%), A(80% - less than 90 %) and S(90% or over).					
Examination					
試験期間中には何も行わない					
None during exam period					
Details of examination					
N/A					
N/A					
Other information					
For any questions, contact your supervisor.					
For any questions, contact your supervisor.					
Reference URL					

N/A

N/A

Office hours

Contact your supervisor.

Contact your supervisor.

Relations to attainment objectives of learning and education

(C) 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 for problem 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 into practice; and to create new technologies to solve problems

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

Have advanced knowledge about mechanical engineering and 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 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 into practice; and to create new technologies to solve problems

Key words

Materials, Manufacturing Process

Materials, Manufacturing Process

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

Subject name[English]	Advanced System, Control and Robotics II[Advanced System, Control and Robotics II]				
Schedule number	M41630260	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Thu.4~4	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS55025				
Objectives of class	<p>This lecture aims to provide a broad understanding of the control and robotics available for the master thesis research work of a student.</p> <p>This lecture aims to provide a broad understanding of the control and robotics available for the master thesis research work of a student.</p>				
Contents of class	<p>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.</p> <p>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.</p>				
Self Preparation and Review	<p>Follow instruction of supervisors.</p> <p>Follow instruction of supervisors.</p>				
Related subjects	<p>Follow instruction of supervisors.</p> <p>Follow instruction of supervisors.</p>				
Notes for textbook	<p>Textbook or material will be made available from the supervisors.</p> <p>Textbook or material will be made available from the supervisors.</p>				
Notes for reference	<p>N/A</p> <p>N/A</p>				
Goals to be achieved	<p>To acquire fundamental knowledge of individual research fields.</p> <p>To acquire the ability to find problems, the ability to solve the problems and the presentation skill.</p> <p>To acquire fundamental knowledge of individual research fields.</p> <p>To acquire the ability to find problems, the ability to solve the problems and the presentation skill.</p>				
Evaluation of achievement	<p>Coursework, presentation and/or report.</p> <p>Grade levels are C(60% - less than 70%), B(70- less than 80%), A(80% - less than 90 %) and S(90% or over).</p> <p>Coursework, presentation and/or report.</p> <p>Grade levels are C(60% - less than 70%), B(70- less than 80%), A(80% - less than 90 %) and S(90% or over).</p>				
Examination	<p>試験期間中には何も行わない</p> <p>None during exam period</p>				
Details of examination	<p>N/A</p> <p>N/A</p>				
Other information	<p>For any questions, contact your supervisor.</p> <p>For any questions, contact your supervisor.</p>				
Reference URL	<p>N/A</p> <p>N/A</p>				

Office hours

Contact your supervisor.

Contact your supervisor.

Relations to attainment objectives of learning and education**機械工学専攻**

(C) 高度な知識を統合的に活用できる実践力・創造力

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

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

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

(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 for problem 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 into practice; and to create new technologies to solve problems

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 for problem 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 into practice; and to create new technologies to solve problems

Key words

System, Control, Robotics

System, Control, Robotics

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

Subject name[English]	Advanced Energy and Environmental Engineering II[Advanced Energy and Environmental Engineering II]				
Schedule number	M41630280	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Fri.4~4	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS56025				
Objectives of class	<p>This lecture aims to provide a broad understanding of the energy and environmental engineering available for the master thesis research work of a student.</p> <p>This lecture aims to provide a broad understanding of the energy and environmental engineering available for the master thesis research work of a student.</p>				
Contents of class	<p>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.</p> <p>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.</p>				
Self Preparation and Review	<p>Follow instruction of supervisors.</p> <p>Follow instruction of supervisors.</p>				
Related subjects	<p>Follow instruction of supervisors.</p> <p>Follow instruction of supervisors.</p>				
Notes for textbook	<p>Textbook or material will be made available from the supervisors.</p> <p>Textbook or material will be made available from the supervisors.</p>				
Notes for reference	<p>N/A</p> <p>N/A</p>				
Goals to be achieved	<p>To acquire fundamental knowledge of individual research fields.</p> <p>To acquire the ability to find problems, the ability to solve the problems and the presentation skill.</p> <p>To acquire fundamental knowledge of individual research fields.</p> <p>To acquire the ability to find problems, the ability to solve the problems and the presentation skill.</p>				
Evaluation of achievement	<p>Coursework, presentation and/or report.</p> <p>Grade levels are C(60% - less than 70%), B(70- less than 80%), A(80% - less than 90 %) and S(90% or over).</p> <p>Coursework, presentation and/or report.</p> <p>Grade levels are C(60% - less than 70%), B(70- less than 80%), A(80% - less than 90 %) and S(90% or over).</p>				
Examination	<p>試験期間中には何も行わない</p> <p>None during exam period</p>				
Details of examination	<p>N/A</p> <p>N/A</p>				
Other information	<p>For any questions, contact your supervisor.</p> <p>For any questions, contact your supervisor.</p>				
Reference URL	<p>N/A</p>				

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。

機械工学専攻

(C) 高度な知識を統合的に活用できる実践力・創造力

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

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

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

(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 for problem 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 into practice; and to create new technologies to solve problems

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 for problem 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 into practice; 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						
<p>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。</p> <p>This lecture will provide the knowledge of modal analysis method and component mode synthesis method to treat a huge degree of freedom system.</p>						
Contents of class						
<p>多自由度系のモード解析</p> <p>1: モード解析の導入, 不減衰系</p> <p>2: 比例粘性減衰系(1)</p> <p>3: 比例粘性減衰系(2)</p> <p>4: 高次モードの影響</p> <p>部分構造合成法</p> <p>5: 分系の定式化</p> <p>6: 拘束モード型モード合成法(1)</p> <p>7: 拘束モード型モード合成法(2)</p> <p>8: 不拘束モード型モード合成法</p> <p>Modal analysis for multi degree of freedom system</p> <p>1: Introduction of modal analysis, undamped system</p> <p>2: A system with proportional viscous damping (1)</p> <p>3: A system with proportional viscous damping (2)</p> <p>4: Compensate of higher vibration modes</p> <p>Component mode synthesis method</p> <p>5: Formulation of sub-systems</p> <p>6: Modal synthesis using constraint modes (1)</p> <p>7: Modal synthesis using constraint modes (2)</p> <p>8: Modal synthesis using non-constraint modes</p>						
Self Preparation and Review						
<p>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。</p> <p>Self-preparation and review are necessary.</p>						
Related subjects						
<p>数学, 機械力学, 振動工学, 応用振動工学</p> <p>Dynamics, Vibration engineering, Mechanical vibration</p>						
Notes for textbook						
<p>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。</p> <p>Handouts will be prepared.</p>						
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						
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						
Other information						
河村庄造: 部屋番号 D-404, E-Mail: kawamura@me.tut.ac.jp Contact person: Prof. Shozo Kawamura E-Mail:kawamura@me.tut.ac.jp						
Reference URL						
Office hours						
E メール等で随時時間を打ち合わせる Ask by E-mail.						
Relations to attainment objectives of learning and education						
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。 (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。						
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 for problem solving 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 into practice; and to create new technologies to solve problems						
Key words						
モード合成法, 部分構造合成法 Modal analysis, Component mode synthesis method						

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

Subject name[English]	Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]				
Schedule number	M42610020	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~1
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S2系教務委員, 2系各教員 2kei kyomu Iin-S, 2kei kakukyoin				
Numbering	ELC_MAS51025				
Objectives of class					
The thesis research aims to provide a practical experience of research work, and to acquire his/her research skill with deep understanding of the electrical and electronic information engineering.					
Contents of class					
The research subject depends on the supervisor and the research group you belong to. Every student will have an individual research subject. For more details, please contact with your supervisor.					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Reference and material will be available from the supervisor.					
Notes for reference					
Goals to be achieved					
To get something new on individual research fields. To develop his/her research skill including the planning and the presentation.					
Evaluation of achievement					
Presentation, Thesis, Coursework, and Outcomes are evaluated generally. Grades: S: 90-100, A:80-89, B:70-79, C:60-69					
Examination					
試験期間中には何も行わない None during exam period					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
(B) Sound ethics and social awareness as advanced-level engineers and researchers Be conscious of specialized and ethical responsibilities as advanced-level engineers and researchers; have the ability to set, solve and evaluate technical issues in society (C) Practical and creative skills to utilize advanced knowledge in an integrated manner					

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

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

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

(D) Communication skills for global success

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

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

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

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

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

Key words

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

Subject name[English]	Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]				
Schedule number	M42610020	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S2系教務委員, 2系各教員 2kei kyomu Iin-S, 2kei kakukyouin				
Numbering	ELC_MAS51025				
Objectives of class					
The thesis research aims to provide a practical experience of research work, and to acquire his/her research skill with deep understanding of the electrical and electronic information engineering.					
Contents of class					
The research subject depends on the supervisor and the research group you belong to. Every student will have an individual research subject. For more details, please contact with your supervisor.					
Self Preparation and Review					
N/A					
Related subjects					
N/A					
Notes for textbook					
Reference and material will be available from the supervisor.					
Notes for reference					
N/A					
Goals to be achieved					
To get something new on individual research fields. To develop his/her research skill including the planning and the presentation.					
Evaluation of achievement					
Presentation, Thesis, Coursework, and Outcomes are evaluated generally. Grades: S: 90-100, A:80-89, B:70-79, C:60-69					
Examination					
試験期間中には何も行わない None during exam period					
Details of examination					
N/A					
Other information					
N/A					
Reference URL					
N/A					
Office hours					
N/A					
Relations to attainment objectives of learning and education					
<p>(B) 技術者・研究者としての正しい倫理観と社会性 上級技術者・研究者として社会的・倫理的責任を有し、社会における技術的課題を設定・解決・評価する能力を身につけている。</p> <p>(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。</p>					

(D) グローバルに活躍できるコミュニケーション力

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

(E) 最新の技術や社会環境の変化に対する探究心と持続的学習力

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

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

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

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

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

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

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

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

(D) Communication skills for global success

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

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

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

Key words

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

Subject name[English]	Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]				
Schedule number	M4261002T	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S2系教務委員, 2系各教員 2kei kyomu Iin-S, 2kei kakukyoin				
Numbering	ELC_MAS51025				
Objectives of class					
The thesis research aims to provide a practical experience of research work, and to acquire his/her research skill with deep understanding of the electrical and electronic information engineering.					
Contents of class					
The research subject depends on the supervisor and the research group you belong to. Every student will have an individual research subject. For more details, please contact with your supervisor.					
Self Preparation and Review					
N/A					
Related subjects					
N/A					
Notes for textbook					
Reference and material will be available from the supervisor.					
Notes for reference					
N/A					
Goals to be achieved					
To get something new on individual research fields. To develop his/her research skill including the planning and the presentation.					
Evaluation of achievement					
Presentation, Thesis, Coursework, and Outcomes are evaluated generally. Grades: S: 90-100, A:80-89, B:70-79, C:60-69					
Examination					
試験期間中には何も行わない None during exam period					
Details of examination					
N/A					
Other information					
N/A					
Reference URL					
N/AA					
Office hours					
N/A					
Relations to attainment objectives of learning and education					
<p>(B) 技術者・研究者としての正しい倫理観と社会性 上級技術者・研究者として社会的・倫理的責任を有し、社会における技術的課題を設定・解決・評価する能力を身につけている。</p> <p>(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。</p> <p>(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</p>					

けている。

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

(D) グローバルに活躍できるコミュニケーション力

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

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

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

(E) 最新の技術や社会環境の変化に対する探究心と持続的学習力

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

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

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

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

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

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

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

Key words

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

Subject name[English]	Seminar on Electrical and Electronic Information Engineering[Seminar on Electrical and Electronic Information Engineering]				
Schedule number	M42610040	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
Numbering	ELC_MAS51015				
Objectives of class					
The seminar aims to provide a broad understanding of theoretical and experimental approaches related to the electrical and electronic information engineering for the research work of his/her master thesis.					
Contents of class					
The class provides both of fundamental knowledge on the research work of master thesis and the most advanced results in the related field by reading research papers and monographs. Contents of the class depend on the supervisor. To be announced by individual supervisors.					
Self Preparation and Review					
N/A					
Related subjects					
N/A					
Notes for textbook					
Textbook or material will be made available from the supervisor. To be announced by individual supervisors.					
Notes for reference					
N/A					
Goals to be achieved					
To acquire fundamental knowledge on individual research fields. To acquire the ability of finding a problem, the ability of solving the problem and the presentation skill.					
Evaluation of achievement					
Coursework, presentation and/or report. Grades: S: 90-100, A:80-89, B:70-79, C:60-69					
Examination					
試験期間中には何も行わない None during exam period					
Details of examination					
N/A					
Other information					
N/A					
Reference URL					
N/A					
Office hours					
N/A					
Relations to attainment objectives of learning and education					
(B) 技術者・研究者としての正しい倫理観と社会性 上級技術者・研究者として社会的・倫理的責任を有し、社会における技術的課題を設定・解決・評価する能力を身につけている。 (C) 高度な知識を統合的に活用できる実践力・創造力 電気・電子情報工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践					

的・創造的能力を身につけている。

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

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

(D) グローバルに活躍できるコミュニケーション力

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

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

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

(E) 最新の技術や社会環境の変化に対する探究心と持続的学習力

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

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

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

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

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

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

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

Key words

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

Subject name[English]	Seminar on Electrical and Electronic Information Engineering 1A[Seminar on Electrical and Electronic Information Engineering 1A]				
Schedule number	M42610050	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	4
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
Numbering	ELC_MAS51015				
Objectives of class					
The seminar aims to provide a broad understanding of theoretical and experimental approaches related to the electrical and electronic information engineering for the research work of his/her master thesis.					
Contents of class					
The class provides both of fundamental knowledge on the research work of master thesis and the most advanced results in the related field by reading research papers and monographs. Contents of the class depend on the supervisor. To be announced by individual supervisors.					
Self Preparation and Review					
N/A					
Related subjects					
N/A					
Notes for textbook					
Textbook or material will be made available from the supervisor. To be announced by individual supervisors.					
Notes for reference					
N/A					
Goals to be achieved					
To acquire fundamental knowledge on individual research fields. To acquire the ability of finding a problem, the ability of solving the problem and the presentation skill.					
Evaluation of achievement					
Coursework, presentation and/or report. Grades: S: 90-100, A:80-89, B:70-79, C:60-69					
Examination					
試験期間中には何も行わない None during exam period					
Details of examination					
N/A					
Other information					
N/A					
Reference URL					
N/A					
Office hours					
N/A					
Relations to attainment objectives of learning and education					
(B) 技術者・研究者としての正しい倫理観と社会性 上級技術者・研究者として社会的・倫理的責任を有し、社会における技術的課題を設定・解決・評価する能力を身につけている。					
(C) 高度な知識を統合的に活用できる実践力・創造力 電気・電子情報工学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。					
(C1) 電気・電子情報工学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につ					

けている。

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

(D) グローバルに活躍できるコミュニケーション力

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

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

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

(E) 最新の技術や社会環境の変化に対する探究心と持続的学習力

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

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

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

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

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

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

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

Key words

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

Subject name[English]	Seminar on Electrical and Electronic Information Engineering 1B[Seminar on Electrical and Electronic Information Engineering 1B]				
Schedule number	M42610060	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
Numbering	ELC_MAS51015				
Objectives of class					
The seminar aims to provide a broad understanding of theoretical and experimental approaches related to the electrical and electronic information engineering for the research work of his/her master thesis.					
Contents of class					
The class provides both of fundamental knowledge on the research work of master thesis and the most advanced results in the related field by reading research papers and monographs. Contents of the class depend on the supervisor. To be announced by individual supervisors.					
Self Preparation and Review					
N/A					
Related subjects					
N/A					
Notes for textbook					
Textbook or material will be made available from the supervisor. To be announced by individual supervisors.					
Notes for reference					
N/A					
Goals to be achieved					
To acquire fundamental knowledge on individual research fields. To acquire the ability of finding a problem, the ability of solving the problem and the presentation skill.					
Evaluation of achievement					
Coursework, presentation and/or report. Grades: S: 90-100, A:80-89, B:70-79, C:60-69					
Examination					
試験期間中には何も行わない None during exam period					
Details of examination					
N/A					
Other information					
N/A					
Reference URL					
N/A					
Office hours					
N/A					
Relations to attainment objectives of learning and education					
<p>(B) 技術者・研究者としての正しい倫理観と社会性 上級技術者・研究者として社会的・倫理的責任を有し、社会における技術的課題を設定・解決・評価する能力を身につけている。</p> <p>(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。</p>					

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

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

(D) グローバルに活躍できるコミュニケーション力

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

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

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

(E) 最新の技術や社会環境の変化に対する探究心と持続的学習力

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

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

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

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

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

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

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

Key words

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

Subject name[English]	Methodology of R & D 2[Methodology of R & D 2]				
Schedule number	M42630110	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Tue.3~3	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beginning 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					
<p>電気・電子情報工学専攻</p> <p>(C) 高度な知識を統合的に活用できる実践力・創造力</p> <p>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。</p> <p>(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。</p> <p>(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</p>					

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 to utilize such knowledge for problem solving in an integrated manner

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

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

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_MAS53025				
Objectives of class					
Objectives of this subject are to understand the fundamental aspects on functional materials, photonics, electrodictics, 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 four topics of functional materials, electrodictics, 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 ionis including Li-ion battery and fuel cell, and 5) Functional materials for optics including coatings, micro-optical components, and photonic devices.					
The category of "electrodictics" is electrochemical reaction on electrode. The contents are 1) fundamentals of thermodynamics in aqueous solution, 2) fundamental of electrical double layer 3) fundamental of adsorption, 4) fundamentals of electrochemical reaction, and 5) applications of chemical sensor.					
The category of "ion recognition reagents" is devoted to the understanding of (1) Fundamentals of chemical analyses, (2) Development of anion recognition reagent by using hydrogen bonding, and (3) Development of moisture sensing in oil with chemical sensor.					
Self Preparation and Review					
Students must perform their preparation and review of this subject based on the course materials with following the instruction of the teachers.					
Related subjects					
Physics for Electronics, Analysis of Inorganic Materials, Advanced Materials for Electronics, Functional Materials for Optical Applications, Analysis of Materials at Interface.					
Notes for textbook					
(1) Atkins' Physical Chemistry, by Peter Atkins (Author), Julio de Paula (Author) (Oxford University Press) (2014)ISBN-10: 019969740X					
(2) Inorganic Chemistry Paperback, by Duward Shriver (Author) (W. H. Freeman)(2014) ISBN-10: 1429299061					
Notes for reference					
Goals to be achieved					
(1) To understand fundamental aspects on functional materials, photonics, electrodictics 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, electrodisc, 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

Electrodisc; 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

電気・電子情報工学専攻

(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.

Graduate Program of Electrical and Electronic Information Engineering for Master's Degree

Key words

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 INADA Ryoji, MURAKAMI Yoshinobu				
Numbering	ELC_MAS53025				
Objectives of class					
<p>This lecture is implemented as an introduction to electrical energy systems and intended for students and other engineering disciplines. It is being useful as reference and self-study guide for the professional dealing with this important area. There are following three sub courses to choose from.</p> <p>This lecture is implemented as an introduction to electrical energy systems and intended for students and other engineering disciplines. It is being useful as reference and self-study guide for the professional dealing with this important area. There are following three sub courses to choose from.</p>					
Contents of class					
<p>Sub Course 1(R. Inada)</p> <ol style="list-style-type: none"> 1. Introduction of Electrochemical Energy Conversion Devices 2. Lithium-Ion Secondary Batteries 3. Recent Trend in Electrochemical Energy Conversion Devices <p>Sub Course 2(Yo. Murakami)</p> <ol style="list-style-type: none"> 1. Introduction of Electric Energy Systems 2. High Voltage Engineering and Electrical Insulation 3. Fundamental Properties of Dielectrics and Electrical Insulating Materials. <p>Sub Course 1(R. Inada)</p> <ol style="list-style-type: none"> 1. Introduction of Electrochemical Energy Conversion Devices 2. Lithium-Ion Secondary Batteries 3. Recent Trend in Electrochemical Energy Conversion Devices <p>Sub Course 2(Yo. Murakami)</p> <ol style="list-style-type: none"> 1. Introduction of Electric Energy Systems 2. High Voltage Engineering and Electrical Insulation 3. Fundamental Properties of Dielectrics and Electrical Insulating Materials. 					
Self Preparation and Review					
Related subjects					
<p>Basic electrical power engineering course is prerequisite.</p> <p>Basic electrical power engineering course is prerequisite.</p>					
Notes for textbook					
<p>Materials will be prepared by the lecturer.</p> <p>Materials will be prepared by the lecturer.</p>					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
<p>Marks are based on examinations(100%).</p> <p>Marks are based on examinations(100%).</p>					
Examination					
<p>定期試験を実施(対面)</p> <p>Examination(Face to Face)</p>					

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

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

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

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

(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。

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

Key words

(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.					
From the viewpoint of deep understanding of LSI processes, semiconductors devices including material desgin and an example of latest device will be lectured.					
Contents of class					
Integrated circuits Sensor processing Optical devices MEMS/NEMS Latest MOS FETs Current topics in IC/MEMS/sensor					
Integrated circuits Sensor processing Optical devices MEMS/NEMS Latest MOS FETs Current topics in IC/MEMS/sensor					
Self Preparation and Review					
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おくこと 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)
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

Reference URL

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

<http://www.int.ee.tut.ac.jp/>
(devison)

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/>
(devison)

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) 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。

(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

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

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

Key words

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

Subject name[English]	Information and Communication Technology 2[Information and Communication Technology 2]				
Schedule number	M42630250	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Mon.3~3	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	大平 孝, 上原 秀幸, 竹内 啓悟 OHIRA Takashi, UEHARA Hideyuki, TAKEUCHI Keigo				
Numbering	ELC_MAS55025				
Objectives of class					
Students select one course from the following three courses: A first course is intended for learning how to design microwave circuits needed for advanced wireless communication systems and wireless power transmission systems. The distributed constant element theory is addressed to characterize linear circuits at high frequencies. Based on this technique, students challenge synthesis of a variety of microwave signal and power processing functions. A second course is intended for learning mainly medium access control, multi-hop communications and other topics related to wireless networks. Students are required to give solutions of the problems which cause performance degradation. The last course is intended for learning point-to-point communication systems, multiuser communication systems, and multiple-input multiple-output (MIMO) systems in the physical layer of wireless communications. Students challenge a unified understanding of existing advanced schemes in wireless communications.					
Contents of class					
Course 1 provided by Prof. Ohira: 1. Transmission lines 2. Scattering matrix 3. Mizuhashi Smith chart Course 2 provided by Prof. Uehara: 1. Medium access control protocols 2. Multi-hop communications 3. Ad hoc and sensor networks Course 3 provided by Prof. Takeuchi: 1. Point-to-point communication systems 2. Multiuser communication systems 3. MIMO systems					
Self Preparation and Review					
Review each lecture and prepare for the next class with reference to the black board and handouts.					
Related subjects					
Before registration, students who want to take this lecture must pass an interview by the professors to check that they satisfy the prerequisites below: Prerequisite of Course 1: Deep understanding on electromagnetic field theory, linear passive and reciprocal circuit theory, and sophisticated experience on complex and matrix mathematics are prerequisite. Prerequisite of Course 2: Deep understanding on the following: wireless digital modulation and demodulation, radio propagation characteristic, signal processing, probability, random variables and stochastic process, and information networks. Prerequisite of Course 3: Basic understanding on modulation/demodulation, signal processing, probability theory, and information theory are prerequisite.					

Note that students who acquired ICT1 in the previous year must take a different course from ICT1.
<p>Notes for textbook</p> <p>Course 1: Lecture on the blackboard without resorting to textbooks.</p> <p>Course 2: Instruct in 1st class.</p> <p>Course 3: Same as Course 2.</p>
<p>Notes for reference</p> <p>N/A</p>
<p>Goals to be achieved</p> <p>Course 1:</p> <ul style="list-style-type: none"> - Understand the distributed constant elements and concept of scattering matrix. - Derive frequency responses on linear RF circuits exploiting Mizuhashi Smith chart. - Characterize various kinds of high frequency functional circuits and compose them based upon given specifications. <p>Course 2:</p> <ul style="list-style-type: none"> - 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 <p>Course 3:</p> <ul style="list-style-type: none"> - 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.
<p>Evaluation of achievement</p> <p>Course 1: Marks are based on the final test.</p> <p>Course 2: Marks are based on reports and presentations.</p> <p>Course 3: Marks are based on reports and tests.</p>
<p>Examination</p> <p>定期試験を実施(対面)</p> <p>Examination(Face to Face)</p>
<p>Details of examination</p> <p>N/A</p>
<p>Other information</p> <p>For e-mail address information, visit http://www.comm.ee.tut.ac.jp/</p>
<p>Reference URL</p> <p>http://www.comm.ee.tut.ac.jp/</p>
<p>Office hours</p> <p>Appoint a time slot via email</p>
<p>Relations to attainment objectives of learning and education</p> <p>(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。</p> <p>(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。</p> <p>(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。</p> <p>(C1)(C2)</p> <p>(C) Practical and creative skills to utilize advanced knowledge in an integrated manner Have advanced knowledge about electrical and electronic information engineering as well as related fields; have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner</p> <p>(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</p> <p>(C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about electrical and electronic information engineering as well as related fields; to make plans for research and</p>

development and put them into practice; and to create new technologies to solve problems

Key words

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

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

Subject name[English]	Seminar on Computer Science and Engineering I[Seminar on Computer Science and Engineering I]				
Schedule number	M43610010	Subject area	Advanced Computer Science and Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	4
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S3系教務委員 3kei kyomu iin-S				
Numbering	CMP_MAS51015				
Objectives of class 各研究室が指定する情報学に関する最先端の技術情報(特に英語による最先端の技術情報)を発見する能力、ならびに、その技術情報を理解、説明、質疑・応答できる能力を養う。 The course is intended for students to study basic materials in depth, related to his/her research subjects in computer science and engineering. It is also aimed for students to acquire various skills, required in general research work, such as those for oral presentation, and technical discussion and writing.					
Contents of class 教員が指定する最先端の技術情報(特に英語による最先端の技術情報)について理解したところを説明する。 教員は技術情報の内容の発見、理解、説明、質疑・応答する方法について直接指導を行う。 While specific contents depend on the research areas students are involved in, it is usually the case for students to read relevant textbooks/research papers and report on them, as well as to present and discuss on the research work of their own.					
Self Preparation and Review 教員が指定する内容に関し、予習・復習を行う。 Consult with your advisor.					
Related subjects 指導教員に問い合わせること。 Consult with your advisor.					
Notes for textbook 指導教員に問い合わせること。 Consult with your advisor.					
Notes for reference					
Goals to be achieved (1)最先端の専門分野の英文が理解でき、わかりやすく説明できる。 (2)技術的な情報を扱う英文が解釈でき、作文できる。 (3)論文の標準的な構成ができる。 (4)発表というスタイルでの情報提供ができる。 (5)情報の不足を質問という形式で指摘できる。 (1) To understand English literature on state-of-the-art areas of expertise, and to explain clearly. (2) To interpret technical information written in English, and to write such information in English. (3) To make a standard construction of a technical paper. (4) To provide information by oral presentation. (5) To point out the lack of information by questions.					
Evaluation of achievement 技術情報の発見に向けた自主性、技術情報の理解度、説明の方法、質問への回答、議論への参加の様子等から総合的に指導教員が判定する。 Will be evaluated by taking into account various factors overall, such as technical explanation, question answering, discussion involvements and so on.					
Examination					

試験期間中には何も行わない

None during exam period

Details of examination

課題レポートやプレゼンテーションに基づいて評価する。

Your supervisor will evaluate your presentation and your reports.

Other information

Reference URL

Office hours

指導教員に問い合わせること。

Consult with your advisor.

Relations to attainment objectives of learning and education

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

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

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

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

Key words

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

Subject name[English]	Seminar on Computer Science and Engineering II[Seminar on Computer Science and Engineering II]				
Schedule number	M43610020	Subject area	Advanced Computer Science and Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Computer Science and Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S3系教務委員 3kei kyomu iin-S				
Numbering	CMP_MAS61015				
Objectives of class 各研究室が指定する情報学に関する最先端の技術情報(特に英語による最先端の技術情報)を発見する能力、ならびに、その技術情報を理解、説明、質疑・応答できる能力を養う。 The course is intended for students to study basic materials in depth, related to his/her research subjects in computer science and engineering. It is also aimed for students to acquire various skills, required in general research work, such as those for oral presentation, and technical discussion and writing.					
Contents of class 教員が指定する最先端の技術情報(特に英語による最先端の技術情報)について理解したところを説明する。 教員は技術情報の内容の発見、理解、説明、質疑・応答する方法について直接指導を行う。 While specific contents depend on the research areas students are involved in, it is usually the case for students to read relevant textbooks/research papers and report on them, as well as to present and discuss on the research work of their own.					
Self Preparation and Review 教員が指定する内容に関し、予習・復習を行う。 Consult with your advisor.					
Related subjects 指導教員に問い合わせること。 Consult with your advisor.					
Notes for textbook 授業にて指定する。 Consult with your advisor.					
Notes for reference					
Goals to be achieved (1)最先端の専門分野の英文が理解でき、わかりやすく説明できる。 (2)技術的な情報を扱う英文が解釈でき、作文できる。 (3)論文の標準的な構成ができる。 (4)発表というスタイルでの情報提供ができる。 (5)情報の不足を質問という形式で指摘できる。 (1) To understand English literature on state-of-the-art areas of expertise, and to explain clearly. (2) To interpret technical information written in English, and to write such information in English. (3) To make a standard construction of a technical paper. (4) To provide information by oral presentation. (5) To point out the lack of information by questions.					
Evaluation of achievement 技術情報の発見に向けた自主性、技術情報の理解度、説明の方法、質問への回答、議論への参加の様子等から総合的に指導教員が判定する。 Will be evaluated by taking into account various factors overall, such as technical explanation, question answering, discussion involvements and so on.					

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

Examination

試験期間中には何も行わない

None during exam period

Details of examination

試験期間中には何も行わない

Non during exam period

Other information

指導教員に問い合わせること。

Consult with your advisor.

Reference URL

Office hours

指導教員に問い合わせること。

Consult with your advisor.

Relations to attainment objectives of learning and education

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

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

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

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

Key words

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

Subject name[English]	Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering]				
Schedule number	M43610030	Subject area	Advanced Computer Science and Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~1
Department Offered	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, 3系各教員 3kei kyomu iin-S, 3kei kakukyoin				
Numbering	CMP_MAS61015				
Objectives of class The course is intended for students to foster their interests in research problems on computer science and engineering and to acquire ability for independent studies. It is also aimed for students to acquire, through thesis research, cooperativeness, a sense of responsibility, abilities for problem solving, research planning, decision making, outcome presentation and subject investigation, and to enhance their creativity and persistency, among others.					
Contents of class It is usually the case that thesis research is carried out on individual bases with specific contents differing from one student to another. Consult with your advisor for any further details.					
Self Preparation and Review Consult with your advisor for them.					
Related subjects Consult with your advisor for them.					
Notes for textbook Consult with your advisor for them.					
Notes for reference					
Goals to be achieved To acquire abilities for doing research and development at technically high level, sophisticated decision making, and leading large scale research projects.					
Evaluation of achievement Three faculty members will be assigned to prepare the evaluation for your thesis research, based on publication records, master thesis, and oral presentation. It will be then finalized by the faculty meeting.					
Examination 試験期間中には何も行わない None during exam period					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					

(D) Communication skills for global success

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

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

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

Key words

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

Subject name[English]	Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering]				
Schedule number	M43610030	Subject area	Advanced Computer Science and Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, 3系各教員 3kei kyomu iin-S, 3kei kakukyoin				
Numbering	CMP_MAS61015				
Objectives of class The course is intended for students to foster their interests in research problems on computer science and engineering and to acquire ability for independent studies. It is also aimed for students to acquire, through thesis research, cooperativeness, a sense of responsibility, abilities for problem solving, research planning, decision making, outcome presentation and subject investigation, and to enhance their creativity and persistency, among others.					
Contents of class It is usually the case that thesis research is carried out on individual bases with specific contents differing from one student to another. Consult with your advisor for any further details.					
Self Preparation and Review Consult with your advisor for them.					
Related subjects Consult with your advisor for them.					
Notes for textbook Consult with your advisor for them.					
Notes for reference					
Goals to be achieved To acquire abilities for doing research and development at technically high level, sophisticated decision making, and leading large scale research projects.					
Evaluation of achievement Three faculty members will be assigned to prepare the evaluation for your thesis research, based on publication records, master thesis, and oral presentation. It will be then finalized by the faculty meeting. [Evaluation basis] Students who attend this class will be evaluated as follows: S: Achieved the high level of "master degree", 90 or higher (out of 100 points). A: Left something to be desired, 80 or higher (out of 100 points). B: Left something to be desired, 70 or higher (out of 100 points). C: Left much to be desired, 60 or higher (out of 100 points).					
Examination 試験期間中には何も行わない None during exam period					
Details of examination					
Other information					
Reference URL					

Office hours

Relations to attainment objectives of learning and education

(D) Communication skills for global success

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

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

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

Key words

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

Subject name[English]	Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering]				
Schedule number	M4361003T	Subject area	Advanced Computer Science and Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Computer Science and Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, 3系各教員 3kei kyomu iin-S, 3kei kakukyoin				
Numbering	CMP_MAS61015				
Objectives of class	<p>The course is intended for students to study basic materials in depth, related to his/her research subjects in computer science and engineering.</p> <p>It is also aimed for students to acquire various skills, required in general research work, such as those for oral presentation, and technical discussion and writing.</p>				
Contents of class	While specific contents depend on the research areas students are involved in, it is usually the case for students to read relevant textbooks/research papers and report on them, as well as to present and discuss on the research work of their own.				
Self Preparation and Review	After the guidance by an individual adviser, the student is expected to conduct his/her research on his/her own with a pioneering spirit.				
Related subjects	Consult with your advisor.				
Notes for textbook	Consult with your advisor.				
Notes for reference					
Goals to be achieved	To acquire abilities for technical readings in English, logical thinking/explanation, and clear presentation.				
Evaluation of achievement	<p>Will be evaluated by taking into account various factors overall, such as technical explanation, question answering, discussion involvements and so on.</p> <p>[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).</p>				
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

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

Subject name[English]	Seminar on Computer Science and Engineering[Seminar on Computer Science and Engineering]				
Schedule number	M43610040	Subject area	Advanced Computer Science and Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Computer Science and Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S3系教務委員 3kei kyomu iin-S				
Numbering	CMP_MAS61015				
Objectives of class 各研究室が指定する情報学に関する最先端の技術情報(特に英語による最先端の技術情報)を発見する能力、ならびに、その技術情報を理解、説明、質疑・応答できる能力を養う。 The course is intended for students to study basic materials in depth, related to his/her research subjects in computer science and engineering. It is also aimed for students to acquire various skills, required in general research work, such as those for oral presentation, and technical discussion and writing.					
Contents of class 教員が指定する最先端の技術情報(特に英語による最先端の技術情報)について理解したところを説明する。 教員は技術情報の内容の発見、理解、説明、質疑・応答する方法について直接指導を行う。 While specific contents depend on the research areas students are involved in, it is usually the case for students to read relevant textbooks/research papers and report on them, as well as to present and discuss on the research work of their own.					
Self Preparation and Review 教員が指定する内容に関し、予習・復習を行う。 Consult with your advisor.					
Related subjects 指導教員に問い合わせること。 Consult with your advisor.					
Notes for textbook 指導教員に問い合わせること。 Consult with your advisor.					
Notes for reference					
Goals to be achieved (1)最先端の専門分野の英文が理解でき、わかりやすく説明できる。 (2)技術的な情報を扱う英文が解釈でき、作文できる。 (3)論文の標準的な構成ができる。 (4)発表というスタイルでの情報提供ができる。 (5)情報の不足を質問という形式で指摘できる。 (1) To understand English literature on state-of-the-art areas of expertise, and to explain clearly. (2) To interpret technical information written in English, and to write such information in English. (3) To make a standard construction of a technical paper. (4) To provide information by oral presentation. (5) To point out the lack of information by questions.					
Evaluation of achievement 技術情報の発見に向けた自主性、技術情報の理解度、説明の方法、質問への回答、議論への参加の様子等から総合的に指導教員が判定する。 Will be evaluated by taking into account various factors overall, such as technical explanation, question answering, discussion involvements and so on. Grade levels are S(90% or over), A(80%-less than 90%), B(70%-less than 80%) and C(60%-less than 70%)					

Examination 試験期間中には何も行わない None during exam period
Details of examination 課題レポートやプレゼンテーションに基づいて評価する。 Your supervisor will evaluate your presentation and your reports.
Other information
Reference URL
Office hours
Relations to attainment objectives of learning and education (C) Practical and creative skills to utilize advanced knowledge in an integrated manner Have advanced knowledge about computer science and engineering as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner (C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as related fields; and to utilize such knowledge in an integrated manner (C2) Have the skills to learn, by experience, methodologies for research and development through integrating extensive knowledge about computer science and engineering as well as related fields; to make plans for research and development and put them into practice; and to create new technologies to solve problems
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					
<p>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.</p> <p>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.</p>					
Contents of class					
<p>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.</p> <ol style="list-style-type: none"> 1.Guidance, Lecture#1(Introduction to subject "Information".) 2.Lecture#2(Computer system for education. and Software as course material.) 3.Lecture#3(Cooperation with the period of integrated study.) 4.Lecture#4(Simulated class: plan and evaluation.) 5.Lecture#5(Keep an "Information" teacher. and Teaching plan.) 6.Lecture#6(Information sending and presentation.) 7.Lecture#7(Group work by collaboration and presentation.) 8.Lecture#8(Media literacy., Information ethics education. and Network.) 9.Presentations of Teaching Plans #1 10.Presentations of Teaching Plans #2 11.Lecture#9(Expression of information and multimedia. and Topics in information society.) 12.Lecture#10(Algorithm and programming. and Information retrieval and database.) 13.Simulated Classes #1 14.Simulated Classes #2 15.Simulated Classes #3 16.Presentations of Final Reports <p>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.</p> <ol style="list-style-type: none"> 1.Guidance, Lecture#1(Introduction to subject "Information".) 2.Lecture#2(Computer system for education. and Software as course material.) 3.Lecture#3(Cooperation with the period of integrated study.) 4.Lecture#4(Simulated class: plan and evaluation.) 5.Lecture#5(Keep an "Information" teacher. and Teaching plan.) 6.Lecture#6(Information sending and presentation.) 7.Lecture#7(Group work by collaboration and presentation.) 8.Lecture#8(Media literacy., Information ethics education. and Network.) 					

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

Self Preparation and Review

Students are required to solve the problems mentioned above.

Students are required to solve the problems mentioned above.

Related subjects

Notes for textbook

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

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

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

Notes for reference

Goals to be achieved

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

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

Evaluation of achievement

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

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

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

Other information

Reference URL

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

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

Office hours

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

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

Relations to attainment objectives of learning and education

情報・知能工学専攻

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

Graduate Program of Computer Science and Engineering for Master's Degree

(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.

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

Subject name[English]	Web Data Engineering 1[Web Data Engineering 1]				
Schedule number	M43630280	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Mon.1~1	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	青野 雅樹 AONO Masaki				
Numbering	CMP_MAS52425				
Objectives of class					
<p>インターネット、すなわち Web 上には、大量のデータが日々作成・蓄積・更新されている。この中から有用なデータを検索し、抽出する Web アプリケーション技術や、複数の Web アプリケーション間でデータをやりとりする技術も重要になってきている。特に、このようなビッグデータをどう表現するかも、アプリケーションをカスケードする場合、必須である。</p> <p>本講義では、Web 上やデータファイルにあるテキストだけでなく、画像、動画、3D モデルなど様々なメディアに対するデータ表現技術、特徴量抽出技術、次元削減を含むインデクシング、テキストマイニング、データマイニング、自然言語処理、情報検索技術、回帰・分類・クラスタリングに代表される統計的機械学習、リンク解析に代表される Web マイニング技術、ならびに深層学習技術に焦点を当て、最新のデータサイエンス技術を講述する。</p> <p>Day by day, a massive amount of data has been generated, accumulated, and updated on the Internet, where data include texts, images, sounds, movies, 2D/3D shapes, numeric values, and their composites. Extracting important pieces of information is crucial in many Closed/Open Web applications. The objectives of this lecture is to demonstrate the state-of-the-art technologies in data science ranging from data representation, data mining, text mining, natural language processing, information retrieval, information extraction, machine learning (including both unsupervised and supervised learning with/without deep learning frameworks), based on fundamental data science technologies.</p>					
Contents of class					
<p>(1)はじめに(Web で扱うデータ、データサイエンス、統計的機械学習の基礎)</p> <p>(2)情報検索序論(検索、類似度、言語モデル、次元削減、評価尺度)、自然言語処理の基礎</p> <p>(3)特徴量抽出、検索、分類、マルチメディア</p> <p>(4)リンク解析、教師なし学習(クラスタリング技術)</p> <p>(5)時系列データマイニング、教師あり学習(特徴抽出と分類)</p> <p>(6)深層学習基礎</p> <p>(7)深層学習応用</p> <p>(8)定期テスト</p> <p>(1) Introduction (Basics of Data Science including Data Representation and Statistical Machine Learning)</p> <p>(2) Information Retrieval (Search, Similarity, Language Model, Dimensional Reduction, Evaluations), and Natural Language Processing</p> <p>(3) Feature Extraction, Search, Classification, Multimedia</p> <p>(4) Web Link Analysis, Unsupervised Learning (Clustering)</p> <p>(5) Time Series Data Mining, Supervised Learning (Classification)</p> <p>(6) Deep Learning Basics</p> <p>(7) Deep Learning Applications</p> <p>(8) Final Exam</p>					
Self Preparation and Review					
<p>基本的なデータマイニング技術(主成分分析・判別分析・回帰分析、クラスタリング)に関しては、各自、予習・復習をしておくこと。特に、授業の補助用 Web ページで、Python (Jupyter notebook) を使った自習教材を準備するので、慣れておくことが好ましい。</p> <p>It is desirable to self-study as well as to review fundamental data mining techniques such as clustering, classification, and regression. It should be noted that the knowledge on machine learning and multivariate analysis techniques such as principal component analysis is a prerequisite to this class. It is recommended installing Python into your computer, because some of the lecture materials are assumed the knowledge of Python.</p>					
Related subjects					
特になし					

N/A

Notes for textbook

授業の資料は、<http://www.kde.cs.tut.ac.jp/~aono/myLecture.html> で公開する。

Materials for this class will be available at <http://www.kde.cs.tut.ac.jp/~aono/myLecture.html>.

Reference1	Book title	Information Retrieval, Implementing and Evaluating Search Engines			ISBN	978-0-262-02651-2
	Author	Stefan Butcher, Charles L.A. Clarke, Gordon V. Cormack	Publisher	MIT Press	Publish year	2010
Reference2	Book title	Data Mining and Analysis			ISBN	978-0-521-76633-3
	Author	Mohammed J. Zaki, Wagner Meira Jr.	Publisher	Cambridge University Press	Publish year	2014
Reference3	Book title	Data Mining Practical Machine Learning Tools and Techniques, Third Edition			ISBN	978-0-12-374856-0
	Author	Ian H. Witten, Eibe Frank, and Mark A. Hall	Publisher	Morgan Kaufmann	Publish year	2011
Reference4	Book title	Python Machine Learning			ISBN	978-1-78355-513-0
	Author	Sebastian Raschka	Publisher	PACKT Publishing	Publish year	2016

Notes for reference

参考書 5

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

著者名: Ricardo Baeza-Yates, Bertier Ribeiro-Neto

出版社: Addison Wesley

ISBN: 978-0-321-41691-9

出版年: 2011

参考書 6

書名「Google's PageRank and Beyond」

著者名: Amy N. Langville, Carl D. Meyer

出版社: Princeton University Press

ISBN: 978-0-691-12202-1

出版年: 2006

Reference #5

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

Authors: Ricardo Baeza-Yates, Bertier Ribeiro-Neto

Publisher: Addison Wesley

ISBN: 978-0-321-41691-9

Year: 2011

Reference #6

Title: 「Google's PageRank and Beyond」

Authors: Amy N. Langville, Carl D. Meyer

Publisher: Princeton University Press

ISBN: 978-0-691-12202-1

Year: 2006

Goals to be achieved

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

The following items have to be achieved:

1. Able to implement and apply fundamental data science (mining) technologies.
2. Able to understand fundamental technologies of information retrieval such as natural language processing, search

performance measures, feature extraction, and ranking methods such as language model
3. Able to understand basics of machine learning (classification, regression, clustering) and deep learning
4. Able to understand basics of Web link analysis, Web content mining, Time series data mining

Evaluation of achievement

原則として、すべての授業に出席したのにつき、下記のように成績を評価する。

定期試験 80 点、課題 20 点の合計で評価する。

S: 90 点以上, A: 80 点以上, B: 70 点以上, C: 60 点以上

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

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

S: (≥ 90), A: (≥ 80), B: (≥ 70), C: (≥ 60)

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

C-511, TEL: 6764, Email: aono@tut.jp

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

Reference URL

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

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

Office hours

事前に aono@tut.jp まで電子メールで予約をとること。

It is recommended that prior email appointment is preferable.

Relations to attainment objectives of learning and education

情報・知能工学専攻

(C) 高度な知識を統合的に活用できる実践力・創造力

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

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

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

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 such knowledge for problem solving in an integrated manner

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

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

Key words

データ・テキストマイニング、情報検索、特徴量抽出、機械学習、深層学習

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

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

Subject name[English]	Statistical Natural Language Processing[Statistical Natural Language Processing]					
Schedule number	M43630340	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective	
Time of starting a course	Spring1 term	Day of the week,period	Wed.3~3	Credit(s)	1	
Faculty	Graduate Program for Master's Degree			Subject grade	1~	
Department Offered	Computer Science and Engineering			Beggining grade	M1	
Charge teacher name[Roman alphabet mark]	秋葉 友良 AKIBA Tomoyoshi					
Numbering	CMP_MAS52525					
Objectives of class						
Important topics on statistical natural language processing will be discussed by focusing on statistical machine translation.						
Contents of class						
Week 1: Introduction						
Week 2: Basic of Probability and Statistics						
Week 3: Language Models						
Week 4: Translation Models						
Week 5: Parameter Estimation						
Week 6: EM Algorithm						
Week 7: Advanced methods in SMT						
Self Preparation and Review						
Review each lecture and prepare for the next class with reference to the textbook.						
Related subjects						
Probability theory, Information theory, Formal language theory						
Notes for textbook						
Resumes will be provided, which are based on:						
•Kevin Knight						
A Statistical MT Tutorial Workbook						
•Seiichi Nakagawa et al.						
Spoken Language Processing and Natural Language Processing						
Reference1	Book title	Statistical Machine Translation		ISBN	978-0521874151	
	Author	Philipp Koehn	Publisher	Cambridge University Press	Publish year	2010
Reference2	Book title	A Statistical MT Tutorial Workbook		ISBN		
	Author	Kevin Knight	Publisher		Publish year	
Notes for reference						
N/A						
Goals to be achieved						
Basics: Understand the basic concepts of natural language processing						
Natural Language Processing: Understand the role of language resources, language and translation models, word alignments, and parameter estimation methods,						
Applications: Understand statistical machine translation system.						
Evaluation of achievement						
Marks are based on reports (100%).						
Examination						
レポートで実施						

By Report
Details of examination N/A
Other information Tomoyosi Akiba: C-505, 44-6758, akiba@cs.tut.ac.jp
Reference URL http://www.cl.ics.tut.ac.jp/~akiba/
Office hours 16:25-17:40, Tuesday
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 spoken language processing, natural language processing, human language technology

(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					
<p>The objective of this class is to understand basis biophysical phenomena in the organisms based on the concept of quantum chemistry, that is, molecular orbital (MO) theory.</p> <p>In achieving this objective, students will be required to attempt to acquire the elementary concepts in MO theory, and they will learn about the electronic properties of biological molecules such as proteins, RNA and DNA.</p> <p>The objective of this class is to understand basis biophysical phenomena in the organisms based on the concept of quantum chemistry, that is, molecular orbital (MO) theory.</p> <p>In achieving this objective, students will be required to attempt to acquire the elementary concepts in MO theory, and they will learn about the electronic properties of biological molecules such as proteins, RNA and DNA.</p>					
Contents of class					
<p>Considering the preliminary knowledge of the participates in this class, some topics from the following things will be chosen to be learned.</p> <p>(1) Basis and elementary concepts for molecular orbital (MO) theory (1 and 2 weeks)</p> <p>(2) Applications of MO method to small molecules (3 and 4 weeks)</p> <p>(3) MO calculations for amino acids and their peptides (5 and 6 weeks)</p> <p>(4) MO calculations for DNA, RNA bases and base pairs (7, 8 and 9 weeks)</p> <p>(5) MO calculations for complexes with proteins and ligand molecules (10, 11 and 12 weeks)</p> <p>(6) MO calculations for DNA, RNA and their complexes with proteins (13, 14 and 15 weeks)</p> <p>Considering the preliminary knowledge of the participates in this class, some topics from the following things will be chosen to be learned.</p> <p>(1) Basis and elementary concepts for molecular orbital (MO) theory (1 and 2 weeks)</p> <p>(2) Applications of MO method to small molecules (3 and 4 weeks)</p> <p>(3) MO calculations for amino acids and their peptides (5 and 6 weeks)</p> <p>(4) MO calculations for DNA, RNA bases and base pairs (7, 8 and 9 weeks)</p> <p>(5) MO calculations for complexes with proteins and ligand molecules (10, 11 and 12 weeks)</p> <p>(6) MO calculations for DNA, RNA and their complexes with proteins (13, 14 and 15 weeks)</p>					
Self Preparation and Review					
<p>Elementary concepts in MO theory as well as biomolecules such as proteins, RNA and DNA are required.</p> <p>Elementary concepts in MO theory as well as biomolecules such as proteins, RNA and DNA are required.</p>					
Related subjects					
<p>特になし N/A</p>					
Notes for textbook					
<p>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</p>					
Notes for reference					
<p>特になし</p>					

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

情報・知能工学専攻

(C) 高度な知識を統合的に活用できる実践力・創造力

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

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

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

(D) グローバルに活躍できるコミュニケーション力

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

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

(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 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 such knowledge for problem solving in an integrated manner

(C1) Have the skills to voluntarily acquire theories and applied knowledge about computer science and engineering as well as

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

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

(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

(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

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					
The objective of this class is to understand chemical, molecular biological and biophysical phenomena that can be solved by molecular simulation technologies.					
In achieving this objective, students will be required to attempt to acquire the elementary concepts in molecular mechanics (MM) method, molecular dynamics (MD) method, molecular orbital (MO) method, and will learn about thermodynamic and electronic properties of small molecules (drug candidate compounds and organic materials) and biopolymers (proteins, RNA and DNA).					
Contents of class					
Considering the preliminary knowledge of the participants in this class, some topics from the following things will be chosen to be learned.					
(1) Outline of molecular simulation (1st week)					
(2) Molecular mechanics (MM) method and local/global minimum search method (2nd and 3rd weeks)					
(3) Molecular dynamics (MD) method and motion equation (4th and 5th weeks)					
(4) Basis of quantum chemistry and molecular orbital (MO) method (6th, 7th and 8th weeks)					
(5) Stereochemistry, statistical thermodynamics and measurement techniques (9th week)					
(6) Analyses of chemical reaction and crystal structure of organic molecules (10 and 11th weeks)					
(7) Biopolymer simulations and bioinformatics (12th and 13rd weeks)					
(8) Chemoinformatics (machine learning) and molecular design theory (14th and 15th weeks)					
Self Preparation and Review					
Related subjects					
Notes for textbook					
documents distributed					
Reference1	Book title	Introduction to Computational Chemistry, 3rd Ed.		ISBN	978-1118825990
	Author	Frank Jensen	Publisher	Wiley	Publish year 2016
Notes for reference					
Goals to be achieved					
The objective of this class is to understand chemical, molecular biological and biophysical phenomena that can be solved by molecular simulation technologies.					
Evaluation of achievement					
[Evaluation basis] Students who attend all classes will be evaluated as follows:					
A: Achieved all goals and obtained total points of exam and reports, 80 or higher (out of 100 points).					

B: Achieved 80% of goals and obtained total points of exam and reports, 65 or higher (out of 100 points).
C: Achieved 60% of goals and obtained total points of exam and reports, 55 or higher (out of 100 points).

Examination

レポートで実施

By Report

Details of examination

Other information

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

Reference URL

under construction

Office hours

Please check the schedule by E-mail in advance.

Relations to attainment objectives of learning and education

(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。

(D) グローバルに活躍できるコミュニケーション力

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

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

(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

(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

Key words

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

(M43630420)Bio-physical Information Systems[Bio-physical Information Systems]

Subject name[English]	Bio-physical Information Systems[Bio-physical Information Systems]				
Schedule number	M43630420	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Mon.4~4	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	福村 直博 FUKUMURA Naohiro				
Numbering	CMP_MAS53025				
Objectives of class					
人の巧みな運動を実現する生体の情報処理メカニズムの理解のための計算論的なアプローチの手法を理解する。 This course lectures on advanced studies on information processing in the nervous systems and computational models for motor controls of the human movements.					
Contents of class					
1. 運動情報処理システムのイントロダクション 運動制御への計算論的アプローチ 2-3. 人の運動制御システムの中心的な問題 4-5. 到達運動 6. 把持運動 7. 描画運動 8. プレゼンテーション 1. Introduction to the computational neuroscience in the motor control system 2-3. Core Problems of human motor control 4-5. Reaching movement 6. Grasping movement 7. Drawing and writing 8. Final Examination (Presentation)					
Self Preparation and Review					
講義資料を事前に Dream Campus にて公開するので、講義当日までにダウンロードしておくこと。 Lecture material is disclosed to Dream Campus system beforehand.					
Related subjects					
視覚認知科学特論(博士前期)、システム・知能科学特論(博士前期) Visual Perception and Cognition, Advanced System and Knowledge Scieeces					
Notes for textbook					
講義資料を事前に Dream Campus にて公開するので、講義当日までにダウンロードしておくこと。 Lecture material is disclosed to Dream Campus system beforehand, so you should download it.					
Reference1	Book title	Human motor control	ISBN	0123742269	
	Author	David A. Rosenbaum	Publisher	Academic	Publish year 2010
Notes for reference					
Goals to be achieved					
1) 脳機能を明らかにするための計算論的なアプローチの手法を理解する 2) ヒトの巧みな運動を実現する情報処理システムや学習機能について理解する 1) Understand the method of computational approach to reveal brain function 2) Understand the information processing system and learning function to achieve a skillful movement of the human					
Evaluation of achievement					
最終日のプレゼンテーション 75%とその他授業中の質疑応答など 25% 左記の割合で総合的に評価する 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 90%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 75%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					

Final presentation 75%, Discussions during class 75%

Students who attend all classes will be evaluated as follows:

S: Achieved all goals and obtained total point of report and final presentation, 90 or higher (out of 100 points).

A: Achieved 90 % of goals and obtained total point of report and final presentation, 80 or higher (out of 100 points).

B: Achieved 75 % of goals and obtained total point of report and final presentation, 70 or higher (out of 100 points).

C: Achieved 60 % of goals and obtained total point of report and final presentation, 60 or higher (out of 100 points).

Examination

授業を実施

Regular Class

Details of examination

Other information

Reference URL

Office hours

Monday 16:20-17:50

Monday 16:20-17:50

Relations to attainment objectives of learning and education

Key words

生体情報、運動情報処理、計算論

Biological information, Motor Control System, Computational theory

(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 1. 概論, 確率モデルの基礎 2. 最尤推定, 推定量の性質 3. 判別モデル, 最適化法 4. 正則化, モデル選択 5. ベイズ学習, サンプリング法 6. 潜在変数モデル, EM アルゴリズム 7. 経験ベイズ法, 近似ベイズ学習 8. 統計的学習理論 1. Introduction, Fundamentals of Probabilistic Models 2. Maximum Likelihood Method, Properties of Estimator 3. Discriminative Model, Optimization Methods 4. Regularization Methods, Model Selection 5. Bayesian Learning, Sampling Method 6. Latent Variable Model, EM Algorithm 7. Empirical Bayes Method, Approximate Bayesian Learning 8. Statistical Learning Theory					
Self Preparation and Review 各回の内容を参考書等で予習し、小テストやその類題を復習することが望ましい。 It is desirable to prepare each class by reading reference books and review each class by solving assigned exercises.					
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-

	Author	David J.C. MacKay	Publisher	Cambridge University Press	Publish year	0521642989 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						
毎回実施する小テストにより評価する。 評価基準: 原則的にすべての講義に出席したものに付き、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、かつ小テストの平均点(100点満点)が90点以上 A: 達成目標を80%達成しており、かつ小テストの平均点(100点満点)が80点以上 B: 達成目標を60%達成しており、かつ小テストの平均点(100点満点)が70点以上 C: 達成目標を40%達成しており、かつ小テストの平均点(100点満点)が60点以上 Scores will be measured comprehensively by the points of the small exercises assigned in every class: [Evaluation basis] Students who attend all classes will be evaluated as follows: S: Achieved all goals and obtained average points of exercises, 90 or higher (out of 100 points). A: Achieved 80 % of goals and obtained average points of exercises, 80 or higher (out of 100 points). B: Achieved 60 % of goals and obtained average points of exercises, 70 or higher (out of 100 points). C: Achieved 40 % of goals and obtained average points of exercises, 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 as needed						
Relations to attainment objectives of learning and education						
(D) グローバルに活躍できるコミュニケーション力 グローバルに変化する社会が抱える課題にチームとして協調して取り組む中で、自らの考えや成果を効果的に表現するコミュニケーション力を身につけている。 (D1) 論文、口頭及び情報メディアを通じて、自分の論点や考えなどを国の内外において効果的に表現・発信し、コミュニケーションする能力を身につけている。						

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

(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

機械学習, 統計的推測, 統計的学習理論

Machine Learning, Statistical Inference, Statistical Learning Theory

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

Subject name[English]	Seminar on Applied Chemistry and Life Science 1[Seminar on Applied Chemistry and Life Science 1]				
Schedule number	M44610050	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	3
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Applied Chemistry and Life Science			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	CHE_MAS55015				
Objectives of class This course will provide the students with opportunities to study on his/her research subjects on applied chemistry and life science by reading textbooks and scientific papers under the guidance of his/her supervisor. The aim of the lesson for the students is to learn knowledge and presentation skills required for his/her research in the seminar as well as to deepen his/her understanding of applied chemistry and life science.					
Contents of class The students will be required to read textbooks and papers written by other language than Japanese, especially English, which are suggested by his/her supervisor, and to report and discuss deeply on his/her research subject in the seminar.					
Self Preparation and Review					
Related subjects Seminar on Applied Chemistry and Life Science 2 Thesis Research on Applied Chemistry and Life Science All other relevant subjects in Applied Chemistry and Life Science					
Notes for textbook Supervisor will recommend textbooks, papers, and research materials to students.					
Notes for reference					
Goals to be achieved To acquire basic knowledge on applied chemistry and life science To understand the contents of scientific papers in a given field of applied chemistry and life science To be able to make oral and poster presentations relevant to papers he/she has read					
Evaluation of achievement The evaluation is based on the scores of reading textbooks and scientific papers, discussions, reports and presentations of his/her research in the seminar. His/her supervisor evaluates the scores. S: 90 or higher (out of 100 points), A: 80 or higher (out of 100 points), B: 70 or higher (out of 100 points), C: 60 or higher (out of 100 points)					
Examination 試験期間中には何も行わない None during exam period					
Details of examination					
Other information Supervisor(s)					
Reference URL http://chem.tut.ac.jp/en/					
Office hours Students are encouraged visiting by appointment.					
Relations to attainment objectives of learning and education (C)高度な知識を統合的に活用できる実践力・創造力					

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

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

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

(D) グローバルに活躍できるコミュニケーション力

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

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

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

(E) 最新の技術や社会環境の変化に対する探究心と持続的学習力

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

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

Key words

Applied chemistry, Life science, Materials science and engineering

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

Subject name[English]	Seminar on Applied Chemistry and Life Science 2[Seminar on Applied Chemistry and Life Science 2]				
Schedule number	M44610060	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	3
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Applied Chemistry and Life Science			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	CHE_MAS65015				
Objectives of class Based on the Seminar on Applied Chemistry and Life Science 1, this course will further provide the students with the opportunity to study on his/her research subject in applied chemistry and life science by reading textbooks and papers under the guidance of his/her supervisor. The students will learn the knowledge and the presentation skills required for his/her research in the seminar.					
Contents of class The students will be required to read textbooks and papers written by other language than Japanese, especially English, which are suggested by his/her supervisor, and to report and discuss deeply on his/her research subject in the seminar.					
Self Preparation and Review					
Related subjects Seminar on Applied Chemistry and Life Science 1 Thesis Research on Applied Chemistry and Life Science All other relevant subjects in applied chemistry and life science					
Notes for textbook Supervisor will recommend textbooks, papers, and research materials to students.					
Notes for reference					
Goals to be achieved To acquire basic knowledge on applied chemistry and life science To understand the contents of scientific papers in a given field of applied chemistry and life science To be able to make oral and poster presentations relevant to papers he/she has read.					
Evaluation of achievement The evaluation is based on the scores of reading textbooks and scientific papers, discussions, reports and presentations of his/her research in the seminar. His/her supervisor evaluates the scores. S: 90 or higher (out of 100 points), A: 80 or higher (out of 100 points), B: 70 or higher (out of 100 points), C: 60 or higher (out of 100 points)					
Examination 試験期間中には何も行わない None during exam period					
Details of examination					
Other information Supervisor(s)					
Reference URL http://chem.tut.ac.jp/en/					
Office hours Students are encouraged visiting by appointment.					
Relations to attainment objectives of learning and education (C)高度な知識を統合的に活用できる実践力・創造力					

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

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

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

(D) グローバルに活躍できるコミュニケーション力

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

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

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

(E) 最新の技術や社会環境の変化に対する探究心と持続的学習力

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

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

Key words

Applied chemistry, Life science, Materials science and engineering

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

Subject name[English]	Thesis Research on Applied Chemistry and Life Science[Thesis Research on Applied Chemistry and Life Science]				
Schedule number	M44610070	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~1
Department Offered	Applied Chemistry and Life Science			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu Iin-S, 4kei kakukyouin				
Numbering	ENV_MAS68015				
Objectives of class					
In the course, the students will perform advanced researches on applied chemistry and life science under the direction of his/her supervisor in the laboratory. The aims of this lesson are to acquire the knowledge and experimental and analytical skills required for his/her research subject, to learn the scientific and social importance of his/her subject by researching for related studies by others, and to write a master's thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.					
Contents of class					
The students are required to have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be described as a master's thesis. The students must also present the results from his/her research, discuss, and answer the questions with the reviewers in the final master's dissertation defense.					
Self Preparation and Review					
Related subjects					
Seminar on Applied Chemistry and Life Science 1 Seminar on Applied Chemistry and Life Science 2					
Notes for textbook					
Supervisor will recommend textbooks, papers, and research materials to students.					
Notes for reference					
Goals to be achieved					
To acquire basic knowledge on applied chemistry and life science To master experimental techniques and analytical skills required for research on a given field of applied chemistry and life science To be able to present and discuss on the results of his/her research To be able to make safety control in experimental work					
Evaluation of achievement					
The score of the course is based on his/her master's thesis and the presentation in the final review of his/her master's thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc). S: 90 or higher (out of 100 points), A: 80 or higher (out of 100 points), B: 70 or higher (out of 100 points), C: 60 or higher (out of 100 points)					
Examination					
試験期間中には何も行わない None during exam period					
Details of examination					
Other information					
Supervisor					
Reference URL					
http://ens.tut.ac.jp/en/					

Office hours

Students are encouraged visiting by appointment.

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

Applied chemistry, Life science, Materials science and engineering

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

Subject name[English]	Thesis Research on Applied Chemistry and Life Science[Thesis Research on Applied Chemistry and Life Science]				
Schedule number	M44610070	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Applied Chemistry and Life Science			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu Iin-S, 4kei kakukyouin				
Numbering	CHE_MAS68015				
Objectives of class					
In the course, the students will perform advanced researches on applied chemistry and life science under the direction of his/her supervisor in the laboratory. The aims of this lesson are to acquire the knowledge and experimental and analytical skills required for his/her research subject, to learn the scientific and social importance of his/her subject by researching for related studies by others, and to write a master's thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.					
Contents of class					
The students are required to have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be described as a master's thesis. The students must also present the results from his/her research, discuss, and answer the questions with the reviewers in the final master's dissertation defense.					
Self Preparation and Review					
Related subjects					
Seminar on Applied Chemistry and Life Science 1 Seminar on Applied Chemistry and Life Science 2					
Notes for textbook					
Supervisor will recommend textbooks, papers, and research materials to students.					
Notes for reference					
Goals to be achieved					
To acquire basic knowledge on applied chemistry and life science To master experimental techniques and analytical skills required for research on a given field of applied chemistry and life science To be able to present and discuss on the results of his/her research To be able to make safety control in experimental work					
Evaluation of achievement					
The score of the course is based on his/her master's thesis and the presentation in the final review of his/her master's thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc). S: 90 or higher (out of 100 points), A: 80 or higher (out of 100 points), B: 70 or higher (out of 100 points), C: 60 or higher (out of 100 points)					
Examination					
試験期間中には何も行わない None during exam period					
Details of examination					
Other information					
Supervisor					
Reference URL					
http://chem.tut.ac.jp/en/					

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

(C) 高度な知識を統合的に活用できる実践力・創造力

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

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

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

(D) グローバルに活躍できるコミュニケーション力

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

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

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

(E) 最新の技術や社会環境の変化に対する探究心と持続的学習力

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

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

Key words

Applied chemistry, Life science, Materials science and engineering

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

Subject name[English]	Thesis Research on Applied Chemistry and Life Science[Thesis Research on Applied Chemistry and Life Science]				
Schedule number	M4461007T	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Applied Chemistry and Life Science			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu Iin-S, 4kei kakukyouin				
Numbering	CHE_MAS68015				
Objectives of class					
In the course, the students will perform advanced researches on applied chemistry and life science under the direction of his/her supervisor in the laboratory. The aims of this lesson are to acquire the knowledge and experimental and analytical skills required for his/her research subject, to learn the scientific and social importance of his/her subject by researching for related studies by others, and to write a master's thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.					
Contents of class					
The students are required to have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be described as a master's thesis. The students must also present the results from his/her research, discuss, and answer the questions with the reviewers in the final master's dissertation defense.					
Self Preparation and Review					
Related subjects					
Seminar on Applied Chemistry and Life Science 1 Seminar on Applied Chemistry and Life Science 2					
Notes for textbook					
Supervisor will recommend textbooks, papers, and research materials to students.					
Notes for reference					
Goals to be achieved					
To acquire basic knowledge on applied chemistry and life science To master experimental techniques and analytical skills required for research on a given field of applied chemistry and life science To be able to present and discuss on the results of his/her research To be able to make safety control in experimental work					
Evaluation of achievement					
The score of the course is based on his/her master's thesis and the presentation in the final review of his/her master's thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc). S: 90 or higher (out of 100 points), A: 80 or higher (out of 100 points), B: 70 or higher (out of 100 points), C: 60 or higher (out of 100 points)					
Examination					
試験期間中には何も行わない None during exam period					
Details of examination					
Other information					
Supervisor(s)					
Reference URL					
http://chem.tut.ac.jp/en/					

Office hours

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

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

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

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

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

(D) Communication skills for global success

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

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

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

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

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

Key words

Applied chemistry, Life science, Materials science and engineering

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

Subject name[English]	Seminar on Applied Chemistry and Life Science[Seminar on Applied Chemistry and Life Science]				
Schedule number	M44610080	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~
Department Offered	Applied Chemistry and Life Science			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	CHE_MAS65015				
Objectives of class This course will provide the students with the opportunity to study on his/her research subject in applied chemistry and life science by reading textbooks and papers under the guidance of his/her supervisor. The students will learn the knowledge and the presentation skills required for his/her research in the seminar.					
Contents of class The students will be expected to read textbooks and papers written by foreign language that are indicated by his/her supervisor, and report and discuss deeply on his/her research subject in the seminar.					
Self Preparation and Review					
Related subjects Thesis Research on Applied Chemistry and Life Science All other relevant subjects in Applied Chemistry and Life Sciences					
Notes for textbook Supervisor will recommend textbooks and papers to students.					
Notes for reference					
Goals to be achieved To acquire basic knowledge on applied chemistry and life science To understand the contents of scientific papers in a given field of applied chemistry and life science To be able to make oral and poster presentations relevant to papers he/she has read					
Evaluation of achievement The evaluation is based on the scores of reading papers, discussions, reports and presentations of his/her research in the seminar. His/her supervisor evaluates the scores. S: 90 or higher (out of 100 points), A: 80 or higher (out of 100 points), B: 70 or higher (out of 100 points), C: 60 or higher (out of 100 points)					
Examination 試験期間中には何も行わない None during exam period					
Details of examination					
Other information Supervisor					
Reference URL http://chem.tut.ac.jp/en/					
Office hours Students are encouraged visiting by appointment.					
Relations to attainment objectives of learning and education (C) Practical and creative skills to utilize advanced knowledge in an integrated manner					

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

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

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

(D) Communication skills for global success

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

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

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

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

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

Key words

Applied chemistry, Life science, Materials science and engineering

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

Subject name[English]	Special Topics in Applied Organic Chemistry[Special Topics in Applied Organic Chemistry]				
Schedule number	M44630100	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Tue.5~5	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Applied Chemistry and Life Science			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	岩佐 精二, 柴富 一孝 IWASA Seiji, SHIBATOMI Kazutaka				
Numbering	CHE_MAS52225				
Objectives of class To provide you with a working knowledge of advanced synthesis of molecular materials.					
Contents of class This course includes the detail of the most recent progress in modern synthetic application of catalysis, organometallics, and the total synthesis of natural products on the basis of retrosynthetic analysis. 1. Total synthesis of bioactive organic compounds. (Iwasa) 2. Advanced modern synthetic organic reactions using transition metals. (Iwasa) 3. Basic concept of oxidative addition and reductive elimination in catalytic cycles. (Iwasa) 4. Synthetic applications of asymmetric synthesis and asymmetric catalysts. (Iwasa) 5. Basic concept of Lewis acid catalyst and organocatalyst. (Shibatomi) 6. Advanced Lewis acid catalysis in organic synthesis. (Shibatomi) 7. Advanced organocatalysis in organic synthesis. (Shibatomi) 8. Organofluorine chemistry. (Shibatomi)					
Self Preparation and Review					
Related subjects Subjects related to Organic Chemistry					
Notes for textbook No textbook is required. Some of information in WebCT will be help for your understanding on this course.					
Notes for reference					
Goals to be achieved A firm understanding on catalyst, stereochemistry, reaction mechanism, and their application for the synthesis of molecular materials is achieved.					
Evaluation of achievement The report on papers from scientific journals such as J.A.C.S and Angew. Chem. will be imposed. A design of novel organic molecular material. Evaluation basis] Students who attend all classes will be evaluated as follows: S: Achieved all goals and obtained total points of exam and reports, 90 or higher (out of 100 points). A: Achieved 80 % goals and obtained total points of exam and reports, 80 or higher (out of 100 points). B: Achieved 70 % of goals and obtained total points of exam and reports, 70 or higher (out of 100 points). C: Achieved 60 % of goals and obtained total points of exam and reports, 60 or higher (out of 100 points).					
Examination レポートで実施 By Report					
Details of examination					
Other information For more information:					

Seiji Iwasa: room (B-506), e-mail (iwasa@ens.tut.ac.jp)
Kazutaka Shibatomi: room (B-507), e-mail (shiba@ens.tut.ac.jp)

Reference URL

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

Office hours

anytime.

Relations to attainment objectives of learning and education

(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。

(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

Key words

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

(M44630110)Developmental Neuroscience[Developmental Neuroscience]

Subject name[English]	Developmental Neuroscience[Developmental Neuroscience]				
Schedule number	M44630110	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Elective
Time of starting a course	Spring2 term	Day of the week,period	Tue.2~2	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Applied Chemistry and Life Science			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	吉田 祥子, 沼野 利佳 YOSHIDA Sachiko, NUMANO Rika				
Numbering	CHE_MAS53225				
Objectives of class					
Objective of class is to develop a new technology for detection of neuronal function in your brain. We deal with neuronal property and development of neuronal circuit, and discuss applicability and problem of your ideas.					
Contents of class					
S Yoshida, (1)Properties of neuronal cells (2)Electrical function and ion transport (3)Chemical information transport (4)Development of neuronal circuit (5)Detection of chemical information (6)Detection of electrical information (7)Detection of cortical development					
R Numano, We pick up topics from chapter2 in Neuron To Brain 4th Ed. (8)Neural inducer in vertebrates (9)Notch and Delta genes (10)Polarity and Segmentation (11)Hox gene function in the nervous system (12)Topic & Discussion					
Self Preparation and Review					
Related subjects					
A firm understanding on fundamental biochemistry and thermodynamics will be necessary.					
Notes for textbook					
Web-based text will be distributed.					
(Reference) From Neuron To Brain 4th Ed, Nicholls et. al. (Sinauer, 2001)					
Notes for reference					
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. 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

その他

Other

Details of examination

Other information

S Yoshida

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

R Numano

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

Reference URL

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

Office hours

Make an appointment by e-mail.

Relations to attainment objectives of learning and education

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

(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。

(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

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					
<p>This course will provide students with the opportunity to understand the basic reaction kinetics and dynamics. Especially, experimental and theoretical treatment of reaction rate constants will be given. Some reaction mechanisms in combustion or atmosphere will be also discussed.</p> <p>This course will provide students with the opportunity to understand the basic reaction kinetics and dynamics. Especially, experimental and theoretical treatment of reaction rate constants will be given. Some reaction mechanisms in combustion or atmosphere will be also discussed.</p>					
Contents of class					
<p>1. Introduction. 2. Chemical reaction and rate theory. 3. Reaction mechanism. 4. Thermodynamics of reaction. 5. Reaction rate theory. (1) 6. Reaction rate theory. (2) 7. Summary</p> <p>1. Introduction. 2. Chemical reaction and rate theory. 3. Reaction mechanism. 4. Thermodynamics of reaction. 5. Reaction rate theory. (1) 6. Reaction rate theory. (2) 7. Summary</p>					
Self Preparation and Review					
Related subjects					
Notes for textbook					
(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.					

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

(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 固体触媒の分析手段である、X線回折法、X線吸収微細構造(XAFS)、蛍光X線法等のX線分光技術に関する知識を習得する To gain knowledge of X-ray spectroscopic techniques including X-ray diffraction, X-ray absorption fine structure (XAFS), and fluorescent X-ray spectroscopy as analytical tools for solid catalysts.					
Contents of class (1) X線分光の基礎 (2) X線回折法の原理、測定、応用 (3) X線回折法の実習 (4) XAFSの原理、測定、解析 (5) 触媒特性化におけるXAFSの応用 (6) 特殊なXAFS測定技術とその応用 (7) 蛍光X線分光の原理、測定、応用 (1) Fundamentals of X-ray and its spectroscopy (2) Principle, measurement, and application of X-ray diffraction (3) Experimental practice of X-ray diffraction (4) Principle, measurement, and analysis of XAFS (5) Application of XAFS to catalyst characterization (6) Advanced XAFS techniques and their applications (7) Principle, measurement, and application of fluorescent X-ray spectroscopy					
Self Preparation and Review					
Related subjects 物理化学および無機化学の基礎的知識を有することが望ましい It is advisable to have basic knowledge of physical and inorganic chemistry.					
Notes for textbook 教科書は使用しない。プリントを配布する。 参考文献 Y.Iwasawa et al., "X-ray absorption fine structure for catalysts and surfaces", World Scientific No textbook is required. A printed synopsis of the class will be given. (Reference) Y.Iwasawa et al., "X-ray absorption fine structure for catalysts and surfaces", World Scientific					
Notes for reference					
Goals to be achieved (1) X線分光の基礎を理解する。 (2) 固体触媒の分析手段であるX線回折法、XAFS、蛍光X線分光を理解する。 (1) Understanding of basics of X-ray spectroscopy (2) Understanding of X-ray diffraction, XAFS, and fluorescent X-ray spectroscopy as analytical tools for solid catalysts.					
Evaluation of achievement レポート 100%					

Reports 100%
Examination レポートで実施 By Report
Details of examination
Other information 水嶋 生智, room : B-303, e-mail: mizushima@chem.tut.ac.jp Takanori Mizushima, room : B-303, e-mail: mizushima@chem.tut.ac.jp
Reference URL
Office hours 随時 Anytime
Relations to attainment objectives of learning and education
Key words X線分光, X線回折法, XAFS, 蛍光X線分光, 固体触媒 X-ray spectroscopy, X-ray diffraction, XAFS, Fluorescent X-ray spectroscopy, Solid catalysts

(M44630290)Advanced Biomaterials Engineering[Advanced Biomaterials Engineering]

Subject name[English]	Advanced Biomaterials Engineering[Advanced Biomaterials Engineering]				
Schedule number	M44630290	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Elective
Time of starting a course	Spring2 term	Day of the week,period	Thu.3~3	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Applied Chemistry and Life Science			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	辻 秀人, 手老 龍吾 TSUJI Hideto, TERO Ryugo				
Numbering	CHE_MAS52225				
Objectives of class					
Biomaterials have been developed and studied in terms of various applications including biomedical, pharmaceutical and environmental applications. This course covers the fundamentals and applications of biomaterials and related experimental techniques.					
Contents of class					
This course deals with all aspects of biobased and biodegradable polymers for biomedical, pharmaceutical, and environmental applications, and of interactions in solutions between biomolecules. The detailed course schedule is shown below. The detailed course schedule is shown below.					
Biobased and biodegradable polymers (Hideto Tsuji): (1) introduction, synthesis, and structures, (2) molding, crystallization, and physical properties, (3) hydrolytic degradation and biodegradation, and (4) applications.					
Biodevice and biosensing (Ryugo Tero): (5) introduction of surface energy and interface energy, (6) molecular assembly in aqueous solution, (7) application to biomaterials and biodevices, and (8) sensing and imaging techniques relating to biomolecules and biomaterials.					
Self Preparation and Review					
If possible, read the reference book chapters which are shown below and you can find them in the university library (Hideto Tsuji). Read the appropriate chapter(s) of the reference book (#3) shown below. You can access it in the university network. (Ryugo Tero)					
Related subjects					
Notes for textbook					
Printed materials will be distributed (Hideto Tsuji). Printed materials will be distributed as necessary (Ryugo Tero).					
Reference1	Book title	Degradation of Poly (Lactide)-Based Biodegradable Materials		ISBN	1604565020
	Author	Hideto Tsuji	Publisher	Nova Science Pub Inc	Publish year
Reference2	Book title	Chapter 21 in "Poly(lactic acid): Synthesis, Structures, Properties, Processing, and Applications"		ISBN	0470293667
	Author	Hideto Tsuji	Publisher	Wiley	Publish year
Reference3	Book title	Nanoscience: Nanobiotechnology and Nanobiology		ISBN	978-3-540-88633-4
	Author	Patrick Boisseau & Marcel Lahmani	Publisher	Springer	Publish year
Notes for reference					
Reference book 3 (Ryugo Tero): http://link.springer.com/book/10.1007%2F978-3-642-28030-6					

<p>Goals to be achieved</p> <p>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).</p>
<p>Evaluation of achievement</p> <p>Presentation (100%) regarding the biobased and biodegradable polymers (Hideto Tsuji) Reporting assignment (100%) which will be given in each class (Ryugo Tero)</p> <p>[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).</p>
<p>Examination</p> <p>その他 Other</p>
<p>Details of examination</p> <p>Presentation (Hideto Tsuji) Reporting assignment (Ryugo Tero)</p>
<p>Other information</p> <p>Room (G-606), e-mail (tsuji@ens.tut.ac.jp), phone: 6922 (Hideto Tsuji) Room (B-405), e-mail (tero@tut.jp), phone: 6791 (Ryugo Tero)</p>
<p>Reference URL</p>
<p>Office hours</p> <p>Immediately after the class (Hideto Tsuji) After the class, or as needed in my office (Ryugo Tero)</p>
<p>Relations to attainment objectives of learning and education</p>
<p>Key words</p>

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

Subject name[English]	Advanced Molecular Design Chemistry 2[Advanced Molecular Design Chemistry 2]				
Schedule number	M44630440	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Applied Chemistry and Life Science			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	CHE_MAS53225				
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.				
Self Preparation and Review					
Related subjects	Advanced Molecular Design Chemistry 1				
Notes for textbook	Supervisor will recommend textbooks and papers to students.				
Notes for reference					
Goals to be achieved	To acquire advanced knowledge on advanced molecular design chemistry. To be able to report and discuss the contents of textbooks and papers he/she has read.				
Evaluation of achievement	The evaluation is based on the scores of reports, presentations, and examination. His/her supervisor evaluates the scores. S: 90 or higher (out of 100 points), A: 80 or higher (out of 100 points), B: 70 or higher (out of 100 points), C: 60 or higher (out of 100 points)				
Examination	試験期間中には何も行わない None during exam period				
Details of examination					
Other information	Supervisor				
Reference URL	http://chem.tut.ac.jp/en/				
Office hours	Students are encouraged visiting by appointment.				
Relations to attainment objectives of learning and education	(C) Practical and creative skills to utilize advanced knowledge in an integrated manner Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner (C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner				

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

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

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

Key words

Applied chemistry, Life science, Materials science and engineering

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

Subject name[English]	Advanced Molecular Functional Chemistry 2[Advanced Molecular Functional Chemistry 2]				
Schedule number	M44630460	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Applied Chemistry and Life Science			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	CHE_MAS54225				
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.					
Self Preparation and Review					
Related subjects					
Advanced Molecular Functional Chemistry 1					
Notes for textbook					
Supervisor will recommend textbooks and papers to students.					
Notes for reference					
Goals to be achieved					
To acquire advanced knowledge on advanced molecular functional chemistry. To be able to report and discuss the contents of textbooks and papers he/she has read.					
Evaluation of achievement					
The evaluation is based on the scores of reports, presentations, and examination. His/her supervisor evaluates the scores. S: 90 or higher (out of 100 points), A: 80 or higher (out of 100 points), B: 70 or higher (out of 100 points), C: 60 or higher (out of 100 points)					
Examination					
試験期間中には何も行わない None during exam period					
Details of examination					
Other information					
Supervisor					
Reference URL					
http://chem.tut.ac.jp/en/					
Office hours					
Students are encouraged visiting by appointment.					
Relations to attainment objectives of learning and education					
(C) Practical and creative skills to utilize advanced knowledge in an integrated manner Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner (C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner					

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

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

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

Key words

Applied chemistry, Life science, Materials science and engineering

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

Subject name[English]	Advanced Molecular Biological Chemistry 2[Advanced Molecular Biological Chemistry 2]				
Schedule number	M44630480	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Applied Chemistry and Life Science			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering	CHE_MAS54125				
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.				
Self Preparation and Review					
Related subjects	Advanced Molecular Biological Chemistry 1				
Notes for textbook	Supervisor will recommend textbooks and papers to students.				
Notes for reference					
Goals to be achieved	To acquire advanced knowledge on advanced molecular biological chemistry. To be able to report and discuss the contents of textbooks and papers he/she has read.				
Evaluation of achievement	The evaluation is based on the scores of reports, presentations, and examination. His/her supervisor evaluates the scores. S: 90 or higher (out of 100 points), A: 80 or higher (out of 100 points), B: 70 or higher (out of 100 points), C: 60 or higher (out of 100 points)				
Examination	試験期間中には何も行わない None during exam period				
Details of examination					
Other information	Supervisor				
Reference URL	http://chem.tut.ac.jp/en/				
Office hours	Students are encouraged visiting by appointment.				
Relations to attainment objectives of learning and education	(C) Practical and creative skills to utilize advanced knowledge in an integrated manner Have advanced knowledge about applied chemistry and life science as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner (C1) Have the skills to voluntarily acquire theories and applied knowledge about applied chemistry and life science as well as related fields; and to utilize such knowledge in an integrated manner				

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

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

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

Key words

Applied chemistry, Life science, Materials science and engineering

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

Subject name[English]	Seismic Evaluation of Existing Buildings[Seismic Evaluation of Existing Buildings]				
Schedule number	M45630030	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Tue.3~3	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	松井 智哉 MATSUI Tomoya				
Numbering	ARC_MAS51025				
Objectives of class					
<p>This course is intended to introduce the Japanese seismic evaluation method for existing buildings, in particular, reinforced concrete buildings. The concept and procedures of this method are outlined in this course, to gain advanced knowledge to evaluate seismic performance of existing buildings.</p> <p>This course is intended to introduce the Japanese seismic evaluation method for existing buildings, in particular, reinforced concrete buildings. The concept and procedures of this method are outlined in this course, to gain advanced knowledge to evaluate seismic performance of existing buildings.</p>					
Contents of class					
1: Introduction 2: Procedure of Seismic Evaluation 3: Seismic Index of Structure: IS 4: Irregularity and Time Indexes: SD and T 5: First Level Screening Procedure 6: Second Level Screening Procedure –Basic Seismic Index of Structure: E0– 7: Second Level Screening Procedure –Strength Index: C– 8: Second Level Screening Procedure –Ductility Index: F– 9: Judgment on Seismic Safety 10: Recent Earthquake Disasters 11: Introduction of Seismic Retrofit 12: Observation of Retrofitted Buildings 13: Observation of Structural Testing 14: Explanation on Assignments 1: Introduction 2: Procedure of Seismic Evaluation 3: Seismic Index of Structure: IS 4: Irregularity and Time Indexes: SD and T 5: First Level Screening Procedure 6: Second Level Screening Procedure –Basic Seismic Index of Structure: E0– 7: Second Level Screening Procedure –Strength Index: C– 8: Second Level Screening Procedure –Ductility Index: F– 9: Judgment on Seismic Safety 10: Recent Earthquake Disasters 11: Introduction of Seismic Retrofit 12: Observation of Retrofitted Buildings 13: Observation of Structural Testing 14: Explanation on Assignments					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Standard for Seismic Evaluation of Existing Reinforced Concrete Buildings, 2001 Standard for Seismic Evaluation of Existing Reinforced Concrete Buildings, 2001					
Notes for reference					
Goals to be achieved					

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

Evaluation of achievement

Report

- 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.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]	島崎 康弘 SHIMAZAKI Yasuhiro				
Numbering	ARC_MAS51025				
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い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) The course is offered as an introduction to a professional-level understanding of indoor air quality control and ventilation method for realizing a good air environment in buildings. The course consists of the following topics: 1. Overview of indoor air environment 2. Building related illness and indoor air quality 3. Physical/chemical characteristics of air quality 4. Measurement techniques of air pollutants 5. Modeling of material emission and sorption 6. Prediction method for indoor air quality (IAQ) in rooms 7. CFD analysis of air movement 8. Performance evaluation of ventilation systems 9. Ventilation system design for pollutant control 10. Guidelines, codes and standard on IAQ 11. Current research and development on IAQ (1) 12. Current research and development on IAQ (2) 13. Current research and development on IAQ (3) 14. Discussion on IAQ related issues (1) 15. Discussion on IAQ related issues (2)					
Self Preparation and Review					

Related subjects
Notes for textbook 関連する資料を配布する The related handouts will be distributed.
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、その達成度をいよって評価する。 Reports related to this subject are reviewed to evaluate the achievement level.
Examination レポートで実施 By Report
Details of examination 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
Relations to attainment objectives of learning and education 建築・都市システム学専攻 (C1) 建築・都市システム学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。 Graduate Program of Architecture and Civil Engineering for Master's Degree (C1) Have the skills to voluntarily acquire theories and applied knowledge about architecture and civil engineering as well as related fields; and to utilize such knowledge in an integrated manner
Key words 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 5kei kyomu iin-S				
Numbering	ARC_MAS51025				
Objectives of class					
It depends on the laboratory. The resistered students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.					
Contents of class					
In each seminar, students pursue several research topics and/or undertake projects collectively and solely under the instruction of the faculty members of the department and/or those of other departments.					
Self Preparation and Review					
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					
(C1) 建築・都市システム学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。					
(C1) Have the skills to voluntarily acquire theories and applied knowledge about architecture and civil engineering as well as related fields; and to utilize such knowledge in an integrated manner					
Key words					

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

Subject name[English]	Advanced Environmental System Planning and Design II[Advanced Environmental System Planning and Design II]				
Schedule number	M45630220	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu iin-S				
Numbering	ARC_MAS51025				
Objectives of class					
It depends on the laboratory. The resistered students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.					
Contents of class					
In each seminar, students pursue several research topics and/or undertake projects collectively and solely under the instruction of the faculty members of the department and/or those of other departments.					
Self Preparation and Review					
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					
(C1) 建築・都市システム学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。					
(C1) Have the skills to voluntarily acquire theories and applied knowledge about architecture and civil engineering as well as					

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

Key words

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

Subject name[English]	Advanced Regional System Planning and Design II[Advanced Regional System Planning and Design II]				
Schedule number	M45630240	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu iin-S				
Numbering	ARC_MAS51025				
Objectives of class					
It depends on the laboratory. The resistered students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.					
Contents of class					
In each seminar, students pursue several research topics and/or undertake projects collectively and solely under the instruction of the faculty members of the department and/or those of other departments.					
Self Preparation and Review					
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					
(C1) 建築・都市システム学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。					
(C1) Have the skills to voluntarily acquire theories and applied knowledge about architecture and civil engineering as well as related fields; and to utilize such knowledge in an integrated manner					
Key words					

(M45630330)Geohazards[Geohazards]

Subject name[English]	Geohazards[Geohazards]				
Schedule number	M45630330	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Tue.5~5	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	松田 達也 MATSUDA Tatsuya				
Numbering	ARC_MAS51025				
Objectives of class					
The objective are to understand the characteristics of geo-hazards such as earthquakes, landslides,and floodings and to learn environment planning to mitigate the disasters.					
The objective are to understand the characteristics of geo-hazards such as earthquakes, landslides,and floodings and to learn environment planning to mitigate the disasters.					
Contents of class					
1 : An introduction to geology and planning					
2 : Earthquakes and faulting					
3 : Volcanic activity					
4 : Soil properties and problems					
5 : Landslides					
6 : Subsidence					
7 : Coastal Process					
8 : Flooding					
9 : Groudwater					
10 : Waste treatment					
11 : Mineral resouses					
12 : Energy resources					
13 : Environmental planning					
14 : Environmental law					
1 : An introduction to geology and planning					
2 : Earthquakes and faulting					
3 : Volcanic activity					
4 : Soil properties and problems					
5 : Landslides					
6 : Subsidence					
7 : Coastal Process					
8 : Flooding					
9 : Groudwater					
10 : Waste treatment					
11 : Mineral resouses					
12 : Energy resources					
13 : Environmental planning					
14 : Environmental law					
Self Preparation and Review					
Related subjects					
Geotechnical Analysis, Advanced Geotechnical Engineering and Hazard Mitigation					
Geotechnical Analysis, Advanced Geotechnical Engineering and Hazard Mitigation					
Notes for textbook					
None					
None					

Notes for reference
<p>Goals to be achieved</p> <ul style="list-style-type: none"> •Understanding the characteristics of geohazards such as earthquake,landslide and flooding. •Understanding the land use planning and law for mitigation of the disaster. •Understanding the characteristics of geohazards such as earthquake,landslide and flooding. •Understanding the land use planning and law for mitigation of the disaster.
<p>Evaluation of achievement</p> <p>Report and the presentation of the report.</p> <p>S: Obtained total points, 90 or higher (out of 100 points).</p> <p>A: Obtained total points, 80 or higher (out of 100 points).</p> <p>B: Obtained total points, 70 or higher (out of 100 points).</p> <p>C: Obtained total points, 60 or higher (out of 100 points).</p> <p>Report and the presentation of the report.</p> <p>S: Obtained total points, 90 or higher (out of 100 points).</p> <p>A: Obtained total points, 80 or higher (out of 100 points).</p> <p>B: Obtained total points, 70 or higher (out of 100 points).</p> <p>C: Obtained total points, 60 or higher (out of 100 points).</p>
<p>Examination</p> <p>レポートで実施</p> <p>By Report</p>
Details of examination
<p>Other information</p> <p>office:D-808</p> <p>Tel:0532-44-6849</p> <p>E-mail:t.matsuda@ace.tut.ac.jp</p> <p>office:D-808</p> <p>Tel:0532-44-6849</p> <p>E-mail:t.matsuda@ace.tut.ac.jp</p>
<p>Reference URL</p> <p>preparing</p> <p>preparing</p>
<p>Office hours</p> <p>12:00-13:00 on Wednesday</p> <p>12:00-13:00 on Wednesday</p>
Relations to attainment objectives of learning and education
<p>Key words</p> <p>geohazard, mitigation planning</p> <p>geohazard, mitigation planning</p>

(M45630350)Water Environment Engineering[Water Environment Engineering]

Subject name[English]	Water Environment Engineering[Water Environment Engineering]				
Schedule number	M45630350	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Fri.4~4	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Begging grade	M1
Charge teacher name[Roman alphabet mark]	井上 隆信, 横田 久里子 INOUE Takanobu, YOKOTA Kuriko				
Numbering	ARC_MAS51025				
Objectives of class					
To know and understand the water quality change in environment and treatment system. To know and understand the water quality management.					
Contents of class					
water 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					
11-13 nutrients, organic matter					
14-15 chemicals in water environment (Yokota)					
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

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

Subject name[English]	Advanced Transportation and Traffic Engineering[Advanced Transportation and Traffic Engineering]				
Schedule number	M45630360	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Fri.2~2	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	杉木 直 SUGIKI Nao				
Numbering	ARC_MAS51025				
Objectives of class					
To obtain the advanced knowledge of theories and methods for policies and planning for transportation and urban structure.					
Contents of class					
By using reports and papers on transportation and urban structure, students learn the advanced transportation theories and methods. Discussion between the lecturer and students will be performed in the lecture time.					
Self Preparation and Review					
Review each lecture and prepare for the next class with reference to the textbook.					
Related subjects					
Advanced Transportation System and Transport Economics					
Notes for textbook					
Textbooks and scientific papers shall be announced at the start of the class.					
Notes for reference					
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/site/trlabotut/home-en					
Office hours					
At any time. Please contact Sugiki by e-mail in advance.					
Relations to attainment objectives of learning and education					
建築・都市システム学専攻 (C)高度な知識を統合的に活用できる実践力・創造力 建築・都市システム学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。					
Graduate Program of Architecture and Civil Engineering for Master's Degree (C) Practical and creative skills to utilize advanced knowledge in an integrated manner Have advanced knowledge about architecture and civil engineering as well as related fields; and have the practical and creative skills to utilizesuch knowledge for problem solving in an integrated manner					

Key words

Transportation system, Urban structure, Simulation model, Evaluation method

(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			Begginning grade	M1	
Charge teacher name[Roman alphabet mark]	浅野 純一郎, 小野 悠 ASANO Junichiro, ONO Haruka					
Numbering	ARC_MAS51025					
Objectives of class						
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						
<ul style="list-style-type: none"> ・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 <ol style="list-style-type: none"> 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						
<p>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)</p> <p>A: 80 or higher (out of 100 points). B: 65 or higher (out of 100 points). C: 55 or higher (out of 100 points).</p>						
Examination						
<p>レポートで実施 By Report</p>						
Details of examination						
Other information						
<p>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</p>						
Reference URL						
<p>http://urbandesign.web.fc2.com/MOTHER-hp/STU-hp/index.html professor ASANO : http://urbandesign.web.fc2.com/MOTHER-hp/STU-hp/index.html</p>						
Office hours						
<p>毎週木曜の 12:00-13:00 office hour:Tuesdays from 12:30-13:30</p>						
Relations to attainment objectives of learning and education						
<p>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</p> <p>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)</p> <p>(C) 高度な知識を統合的に活用できる実践力・創造力 建築・都市システム学およびその関連分野に関する高度な知識を修得し、それらを課題解決のために統合的に活用できる実践的・創造的能力を身につけている。 (C1) 建築・都市システム学およびその関連分野の理論・応用知識を自発的に獲得し、それらを統合的に活用できる能力を身につけている。</p> <p>(C) Practical and creative skills to utilize advanced knowledge in an integrated manner Have advanced knowledge about architecture and civil engineering as well as related fields; and have the practical and creative skills to utilizesuch knowledge for problem solving in an integrated manner (C1) Have the skills to voluntarily acquire theories and applied knowledge about architecture and civil engineering as well as related fields; and to utilize such knowledge in an integrated manner</p>						
Key words						
<p>地区 都市デザイン 土地利用 景観整備 district scale, urban design, land use, landscape preservation</p>						

(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_MAS51025				
Objectives of class					
<p>公共建築および公共空間を設計する際に、必要な知識とそれらを設計・計画するために有効な設計技術について学ぶ。 Advanced Architectural Design is a kind of digital design studio. Learn the necessary knowledge and design techniques in designing and planning public buildings and space through case study and design works.</p>					
Contents of class					
<p>1. ガイダンス、「建築設計とは？」 2. 公共施設・公共空間の設計に求められること 1 3. 公共施設・公共空間の設計に求められること 2 4. 公共施設・公共空間の設計に必要な知識・設計技術とは 5. 設計技術習得のためのワークショップ 1(基礎) 6. 設計技術習得のためのワークショップ 2(基礎) 7. 設計技術習得のためのワークショップ 3(基礎) 8. 設計技術習得のためのワークショップ 4(応用) 9. 設計技術習得のためのワークショップ 5(応用) 10. 設計技術習得のためのワークショップ 6(応用) 11. 公共施設・公共空間の設計・計画 1 (調査) 12. 公共施設・公共空間の設計・計画 2 (設計作業) 13. 公共施設・公共空間の設計・計画 3(設計作業) 14. 公共施設・公共空間の設計・計画 4(提案) 15. 全体まとめ</p> <p>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</p>					
Self Preparation and Review					
<p>各回のテーマに関連する建築とその社会的状況について調べ、あなたなりの考えを述べるができるよう準備をしてください。 Please survey the buildings related to each theme as much as possible, investigate its social situation, and prepare to describe your thoughts.</p>					
Related subjects					
<p>計画序論 建築設計演習 I からVI 建築設計演習基礎</p>					
Notes for textbook					

Notes for reference

Please refer them (sorry, Japanese only).

建築設計資料集成・総合編・日本建築学会編(丸善、2001年)

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

Goals to be achieved

公共建築および社会基盤施設の設計・計画のための設計技術を習得する。

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

Evaluation of achievement

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

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

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 90%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 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 70 点以上

C: 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 60 点以上

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

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

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**

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

(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	Tue.4~4	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	渋澤 博幸 SHIBUSAWA Hiroyuki				
Numbering	ARC_MAS51025				
Objectives of class					
In this course, students learn the economic modeling techniques and the simulation methodology. In this course, students learn the economic modeling techniques and the simulation methodology.					
Contents of class					
1-2: Input-Output Model 3-4: Simple 2 Sectors General Equilibrium Model 5-6: Inter-Sectoral General Equilibrium Model 7-8: Simulation and Numerical Example 9-11: Open Model with Exports and Imports 12-13: General Equilibrium Model with Public Sector 14-15: Simulation and Numerical Example 1-2: Input-Output Model 3-4: Simple 2 Sectors General Equilibrium Model 5-6: Inter-Sectoral General Equilibrium Model 7-8: Simulation and Numerical Example 9-11: Open Model with Exports and Imports 12-13: General Equilibrium Model with Public Sector 14-15: Simulation and Numerical Example					
Self Preparation and Review					
Required Assignments Students are required to learn topics and exercises before and after each class. Required Assignments Students are required to learn topics and exercises before and after each class.					
Related subjects					
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: 65 points or higher, C:55 points or higher, D: Less than 55 points Reports must be submitted. Report 100%.					

S:90 Points or higher A: 80 Points or higher, B: 65 points or higher, C:55 points or higher, D: Less than 55 points

Examination

レポートで実施
By Report

Details of examination

N/A

Other information

N/A

Reference URL

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

Office hours

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

Relations to attainment objectives of learning and education

(C) 高度な知識を統合的に活用できる実践力・創造力

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

(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 architecture and civil engineering as well as related fields; and have the practical and creative skills to utilize such knowledge for problem solving in an integrated manner

(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

Computational Economics, Simulation
Computational Economics, Simulation