Syllabus

International Master′s Degree Program

（2014-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.2～2	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Common			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	宮田 譲, 藤原 孝男 MIYATA Yuzuru, FUJIWARA Takao				
Numbering					

Objectives of class

In Management Science 1, the class objective is to learn the introductory finance on the firm value and capital cost from the management point of view.

In Management Science 2, the lecture will focus on the statistical methodology frequently applied in management science. In particular, multivariate analysis will be emphasized in the lecture.
In addition, this subject is lectured in English for foreign students in English course.

In Management Science 1, the class objective is to learn the introductory finance on the firm value and capital cost from the management point of view.

In Management Science 2, the lecture will focus on the statistical methodology frequently applied in management science. In particular, multivariate analysis will be emphasized in the lecture.
In addition, this subject is lectured in English for foreign students in English course.

Contents of class

In Management Science 1, the class content will be explained about the fundamental ideas of pricing options in financial derivatives, based on the basic probability, normal random variables, geometric Brownian motion, interest rate, arbitrage, Black-Scholes formula, valuing by expected utility, exotic options, and so on.
8th week will be examination.

In Management Science 2, the lecture includes mathematical expression of multivariate statistical data, multivariate regression analysis, principal component analysis, and so on.

The handout will be distributed to students. Students must learn the contents of the handout before and after each lecture.

In Management Science 1, the class content will be explained about the fundamental ideas of pricing options in financial derivatives, based on the basic probability, normal random variables, geometric Brownian motion, interest rate, arbitrage, Black-Scholes formula, valuing by expected utility, exotic options, and so on.
8th week will be examination.

In Management Science 2, the lecture includes mathematical expression of multivariate statistical data, multivariate regression analysis, principal component analysis, and so on.

The handout will be distributed to students. Students must learn the contents of the handout before and after each lecture.

Self Preparation and Review

Management Science 1: Materials will be uploaded at moodle. Preview is possible by them.
Management Science 1: Materials will be uploaded at moodle. Preview is possible by them.

Related subjects

Nothing in particular
Nothing in particular

Notes for textbook

In Management Science 2, the lecture materials will be distributed to students at the class.
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Reference1	**Book title**	An Introduction to Mathematical Finance	**ISBN**	978-0521770439

	Author	Sheldon M. Ross	**Publisher**	Cambridge University Press,	**Publish year**	1999
Reference2	**Book title**	Investment Science			**ISBN**	978-0199740086
	Author	David G. Luenberger	**Publisher**	Oxford University Press	**Publish year**	1998

Notes for reference

Goals to be achieved

To understand the mathematical finance theory and multivariate analysis.
To understand the mathematical finance theory and multivariate analysis.

Evaluation of achievement

In Management Science 1, scoring assignment will consist of term examination 80% and reports 20%.

In Management Science 2, students will be evaluated by a term report on the lecture (100%).
In Management Science 1, scoring assignment will consist of term examination 80% and reports 20%.

In Management Science 2, students will be evaluated by a term report on the lecture (100%).

Examination

レポートで実施
By Report

Details of examination

Other information

Management Science 1: Takao Fujiwara,Office#:B-313,phone:44-6946,e-mail:fuji313@me.com
Office Hour: 4:00 to 5:00 PM, on Wednesdays (Fujiwara)

Management Science 2: Yuzuru Miyata, Office#:B-411, phone:44-6955,e-mail:miyata@ace.tut.ac.jp
Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday (Prof. Miyata)

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Reference URL

http://pm.hse.tut.ac.jp/kakenA/
http://pm.hse.tut.ac.jp/kakenA/

Office hours

Management Science 1: Takao Fujiwara,Office Hour: 4:00 to 5:00 PM, on Wednesdays

Management Science 2: Yuzuru Miyata,Office Hour: 4 o'clock to 5 o'clock in the afternoon, Tuesday
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Relations to attainment objectives of learning and education

Key words

finance, stochastic process, multivariate analysis
finance, stochastic process, multivariate analysis

(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**	Wed.3～3	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Common			**Beggining grade**	M1, M2
Charge teacher name[Roman alphabet mark]	Lim Pang Boey, 泉田 英雄, 澁谷 晃, 大門 裕之, 齊藤 大樹, 穂積 直裕, 高嶋 孝明, 井佐原 均, 藤原 孝男, 寺嶋 一彦, 加藤 三保子, 柴崎 一郎, 鈴木 新一, 原 邦彦 Lim Pang Boey, IZUMIDA Hideo, SHIBUYA Akira, DAIMON Hiroyuki, SAITOH Taiki, HOZUMI Naohiro, TAKASHIMA Takaaki, ISAHARA Hitoshi, FUJIWARA Takao, TERASHIMA Kazuhiko, KATOH Mihoko, SHIBASAKI Ichiro, SUZUKI Shinichi, HARA Kunihiko				
Numbering					

Objectives of class

In this series of lectures, the excellent experts of our university from different areas will impart for the engineering students highly interesting insider knowledge. The participants will get to know Japan of today from technical, economic and social viewpoints.

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Contents of class

1. 4/9 Lim Pang Boey "Japanese Education System"
Learn about the Japanese education system and what the life of a student is like in Japan?

2. 4/16 Izumida Architecture undergoes deterioration soon after its completion, and may get damage by disaster. Japanese architect/engineer make an effort to restore the damaged architectural heritage.

3. 4/23 Shibuya This lecture aims to introduce Japan's international cooperation and mainly focuses on its historical background, basic implementation framework/system and activities of Official Development Assistance (ODA) of Japanese Government, and further, current issues for sustainable development of developing countries.

4. 5/7 Daimon "Working in Japanese Company"
Learn and discuss about working in Japanese company and what you should do for it.

5. 5/14 Daimon "Waste Management"
Learn and discuss about the policy and concept on waste management in Jpanese society.

6. 5/21 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.

7. 5/28 Hozumi "Japan's Modernization Suppoted by Electric Power"
Japan's modernization started in the middle of 19 th centry when a long period of isolation
policy has been terminated. Her repid growth until now has been strongly supported by electric
power. Now Japan's power supply is recognized as the best quality in the world. In the
lecture,history and state of the art of Japan's electric power will be presented.

8. 6/4 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.
An insight that the lecturer got from the experience of working in IBM for 32 years is also shared.

9. 6/11 Isahara "Computer and Japanese"
Japanese language is very much different from other languages. Problems caused by such differences during computer processing of Japanese are discussed in this lecture.

10. 6/18 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.

11. 6/25 Terashima "Robot in Japan "
Robot is very popular in Japan. Especially, industry robot is number one all over the world.
The year of 1980 is said to be the first year of robotics in Japan.
Since then, Japanese robot has been extremely developed. In this lecture, history of robotics development and state of art in robot is lectured.

12. 7/2 Kato "Globalization and diversification of English"
English is the common international language. This lecture considers how English is used in the world, examining and contrasting the different varieties of English spoken by both native and non-native speakers. The many social and linguistic problems caused by the spread of English will be discussed.

13. 7/9 Shibazaki In this lecture, I will give an example of reseach and development of new technology by Japanese company. The thin film Hall element or Hall sensor is a high sensitivity magnetic sensor which can detect magnetic flux density by using Hall effect. The main application is magnetic sensors to detect angular velocity of permanent magnet rotor of DC brushless motor or Hall motor. Why the Hall element must be developed and used so much is an interesting story. It may be also shown that how mass prosuction technology of Hall sensors was developed.

14. 7/16 Suzuki "Relativety, Energy and Japan"
Energy is one of the biggest issues for Japan.
The class reviews the origin of the concept of nuclear energy and
the relation between nuclear energy and Japan.

15. 7/23 Kunihiko Hara: "Excellent Leaders for creating tommorow of Japan"
Based on lecturer's work experiences, i.e. his career at DENSO Corporation as a member of the board and a director of DENSO Research Laboratories, Nippon Soken, Inc. as a senior executive director and a member of the board, and Genesis Research Institute, Inc. as an executive vice president and a member of the board, and teaching experience in "Taylor-Made and Baton-Zone" graduate course for three and half years in TUT, an insight what the excellent leaders should be will be introduced.

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Based on lecturer’s work experiences, i.e. his career at DENSO Corporation as a member of the board and a director of DENSO Research Laboratories, Nippon Soken, Inc. as a senior executive director and a member of the board, and Genesis Research Institute, Inc. as an executive vice president and a member of the board, and teaching experience in “Taylor-Made and Baton-Zone” graduate course for three and half years in TUT, an insight what the excellent leaders should be will be introduced.

Self Preparation and Review

Related subjects
ない。
ない。

Notes for textbook

Notes for reference

Goals to be achieved

Evaluation of achievement

Examination
レポートで実施

By Report

Details of examination

Other information

Reference URL

Office hours
授業の後
授業の後

Relations to attainment objectives of learning and education

Key words
日本 、日本人、文化、宗教、政治経済、技術
日本 、日本人、文化、宗教、政治経済、技術

(M40030060)Intercultural Communication[Intercultural Communication]

Subject name[English]	Intercultural Communication[Intercultural Communication]				
Schedule number	M40030060	**Subject area**	General courses	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Mon.2～2	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Common			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	村松　由起子 MURAMATSU Yukiko				
Numbering					

Objectives of class

This is a Japanese conversation class mixed with the international and Japanese students of the regular course. The students will learn basic Japanese grammar to speak Japanese.

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Contents of class

This class has the following three parts.

①Japanese grammar points for group activities
②Group activities (conversation practice & discussion)
③Elementary Japanese lessons

You will learn the following lessons in Japanese textbook "Minna no Nihongo".
1. Pronunciation of Japanese & Lesson 1
2. Pronunciation of Japanese & Lesson 2
3. Lesson 3,4
4. Lesson 5,6
5. Lesson 7,8
6. Lesson 9,10
7. Lesson 11,12
8. Lesson 13,14
9. Lesson 15,16
10.Lesson 17,18
11.Lesson 19,20
12.Lesson 21,Nonverbal communication
13.Nonverbal communication
14.Lesson 22,23
15.Lesson 24,25

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5. Lesson 7,8
6. Lesson 9,10
7. Lesson 11,12

8. Lesson 13,14
9. Lesson 15,16
10.Lesson 17,18
11.Lesson 19,20
12.Lesson 21,Nonverbal communication
13.Nonverbal communication
14.Lesson 22,23
15.Lesson 24,25

Self Preparation and Review

Related subjects

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

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Notes for textbook

みんなの日本語　初級Ⅰ翻訳・文法解説　英語版(Minnna no Nihongo 1 Translation & Grammatical Notes　English) ￥2,000
みんなの日本語　初級Ⅰ翻訳・文法解説　英語版(Minnna no Nihongo 1 Translation & Grammatical Notes　English) ￥2,000

Notes for reference

Goals to be achieved

Evaluation of achievement

Homework 40%
The term examination (L.1～L.22)60%
Homework 40%
The term examination (L.1～L.22)60%

Examination

Details of examination

Other information

office:　B-513
e-mail:　yukiko@las.tut.ac.jp
phone:　44-6962
office:　B-513
e-mail:　yukiko@las.tut.ac.jp
phone:　44-6962

Reference URL

Office hours

Monday 13:00-13:30
Monday 13:00-13:30

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Seminar on Mechanical Engineering I[Seminar on Mechanical Engineering I]				
Schedule number	M41610010	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	4
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Mechanical Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering					

Objectives of class

The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.

The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.

Contents of class

The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.

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Self Preparation and Review

Related subjects

Notes for textbook

Textbook or material will be made available from the supervisors.

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Notes for reference

Goals to be achieved

To acquire fundamental knowledge of individual research fields.
To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.

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.

Coursework, presentation and/or report.

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Seminar on Mechanical Engineering II[Seminar on Mechanical Engineering II]				
Schedule number	M41610020	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Mechanical Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering					

Objectives of class

The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.

The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.

Contents of class

The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.

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Self Preparation and Review

Related subjects

Notes for textbook

Textbook or material will be made available from the supervisors.

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Notes for reference

Goals to be achieved

To acquire fundamental knowledge of individual research fields.
To acquire the ability to find problems, the ability to solve the problems, and the presentation skill.

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Evaluation of achievement

Coursework, presentation and/or report.

Coursework, presentation and/or report.

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

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

Objectives of class

The thesis research aims to provide a practical experience of research work, and to acquire research skills with deep understanding of the relevant knowledge.

The thesis research aims to provide a practical experience of research work, and to acquire research skills with deep understanding of the relevant knowledge.

Contents of class

The research subject depends on the supervisor and the research group you join. Individual students will have different research subjects. Discuss with your supervisor.

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Self Preparation and Review

Related subjects

Notes for textbook

Reference and material will be available from the supervisor.

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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.

To get something new on individual research fields.

To develop your research skills including planning and presentation skills.

Evaluation of achievement

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

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

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.

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Contents of class

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Self Preparation and Review

Related subjects

Notes for textbook

Reference and material will be available from the supervisor.

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Notes for reference

Goals to be achieved

To get something new on individual research fields.
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Evaluation of achievement

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

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

Objectives of class

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Self Preparation and Review

Related subjects

Notes for textbook

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Notes for reference

Goals to be achieved

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To develop your research skills including planning and presentation skills.

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Evaluation of achievement

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Seminar on Mechanical Engineering[Seminar on Mechanical Engineering]				
Schedule number	M41610040	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Mechanical Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
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Coursework, presentation and/or report.

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Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Joining and Surfacing of Materials[Joining and Surfacing of Materials]				
Schedule number	M41630070	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Spring1 term	**Day of the week,period**	Tue.1～1	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Mechanical Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	福本　昌宏 FUKUMOTO Masahiro				
Numbering					

Objectives of class

To understand fundamentals of advanced technology in materials joining, especially both in high performance thick coating formation by Thermal Spraying, Cold Spraying, Aero-sol Deposition, in non-melting diffusion bonding by Friction Stir Welding.

To understand fundamentals of advanced technology in materials joining, especially both in high performance thick coating formation by Thermal Spraying, Cold Spraying, Aero-sol Deposition, in non-melting diffusion bonding by Friction Stir Welding.

Contents of class

1. Fundamental of surface modification process and technology
2. Fundamentals of thermal spray process, Splat formation problem
3. Process control with Transition temperature & Transition pressure
4. Cold spraying and Aero-sol deposition process, Functional materials coating: photocatalyst, SOFC, nano coating, intermetallic compound coating, etc.
5. Fundamental of Friction Stir Welding
6. Joining between disimillar materials by FSW
7. Friction spot welding, practical applications of FSW

1. Fundamental of surface modification process and technology
2. Fundamentals of thermal spray process, Splat formation problem
3. Process control with Transition temperature & Transition pressure
4. Cold spraying and Aero-sol deposition process, Functional materials coating: photocatalyst, SOFC, nano coating, intermetallic compound coating, etc.
5. Fundamental of Friction Stir Welding
6. Joining between disimillar materials by FSW
7. Friction spot welding, practical applications of FSW

Self Preparation and Review

Related subjects

Basic knowledge on materials joining process is desirable.

Basic knowledge on materials joining process is desirable.

Notes for textbook

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

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

Notes for reference

Goals to be achieved

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

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

-Features of functionally gradient material and composite material

Evaluation of achievement

Interim report & presentation (40%) and term-end report (60%).

Interim report & presentation (40%) and term-end report (60%).

Examination

レポートで実施

By Report

Details of examination

Other information

Masahiro Fukumoto:

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

Masahiro Fukumoto:

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

Reference URL

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

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

Office hours

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

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

Relations to attainment objectives of learning and education

Key words

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

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

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

Subject name[English]	Modeling and Analysis of Dynamical Control Systems[Modeling and Analysis of Dynamical Control Systems]				
Schedule number	M41630130	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Thu.2～2	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Mechanical Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	寺嶋　一彦 TERASHIMA Kazuhiko				
Numbering					

Objectives of class

Understand Nonlinear Systems Analysis from the viewpoints of Phase Plane Analysis, Fundamental Lyapunov Theory, Advanced Stability Theory, and Control Design

Understand Nonlinear Systems Analysis from the viewpoints of Phase Plane Analysis, Fundamental Lyapunov Theory, Advanced Stability Theory, and Control Design

Contents of class

We provide the following schedule. Because this course is for master students, we can consider the requests from the master students.

1st week: Introduction– Why nolinear control ?
2nd week: Phase Plane Analysis
3rd week: Fundamentals of Lyapunov Theory– Concept of stability
4th week: System Analysis Based on Lyapunov's Direct Method
5th week: Control Design Based on Lyapunov's Direct Method
6th week: Lyapunov Analysis of Non-autonomous systems
7th week: Existence of Lyapunov Functions
8th week: Examination (Report)

We provide the following schedule. Because this course is for master students, we can consider the requests from the master students.

1st week: Introduction– Why nolinear control ?
2nd week: Phase Plane Analysis
3rd week: Fundamentals of Lyapunov Theory– Concept of stability
4th week: System Analysis Based on Lyapunov's Direct Method
5th week: Control Design Based on Lyapunov's Direct Method
6th week: Lyapunov Analysis of Non-autonomous systems
7th week: Existence of Lyapunov Functions
8th week: Examination (Report)

Self Preparation and Review

Related subjects

Fundamentals of linear algebra, differential equation, mechanics, measurement and control theory, and robotics.

Fundamentals of linear algebra, differential equation, mechanics, measurement and control theory, and robotics.

Notes for textbook

Handouts will be prepared.

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

Handouts will be prepared.

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

Notes for reference

Goals to be achieved

(1) Understand Analysis methods of Nonlinear Dynamical Systems
(2) Understand Phase Plane Method
(3) Understand Stability
(4) Understand Lyapunov Analysis
(5) Understand Control Design based on Lyapunov Direct Method

(1) Understand Analysis methods of Nonlinear Dynamical Systems
(2) Understand Phase Plane Method
(3) Understand Stability
(4) Understand Lyapunov Analysis
(5) Understand Control Design based on Lyapunov Direct Method

Evaluation of achievement

Report (100 %)

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

Report (100 %)

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

Examination

レポートで実施
By Report

Details of examination

Other information

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

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

Reference URL

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

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

Office hours

Thursday 4-6pm (Terashima D-510)

Thursday 4-6pm (Terashima D-510)

Relations to attainment objectives of learning and education

(D1) Ability for solving problems with expertise

(D1) Ability for solving problems with expertise

Key words

Nonlinear analysis, Nonlinear control, Lyapunov function, Phase plane analysis, Stability

Nonlinear analysis, Nonlinear control, Lyapunov function, Phase plane analysis, Stability

(M41630180)Applied Fluid Dynamics[Applied Fluid Dynamics]

Subject name[English]	Applied Fluid Dynamics[Applied Fluid Dynamics]				
Schedule number	M41630180	**Subject area**	Advanced Mechanical Engineering	**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**	2～2
Department Offered	Mechanical Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	鈴木 孝司, 関下 信正 SUZUKI Takashi, SEKISHITA Nobumasa				
Numbering					

Objectives of class

(T.Suzuki) Gain and develop the knowledge on numerical method of gas-liquid two-phase flows.

(T.Suzuki) Gain and develop the knowledge on numerical method of gas-liquid two-phase flows.

Contents of class

(N.Sekishita)

(T.Suzuki) Numerical analysis of the liquid flow with free surface
5th Introduction to finite differential method (Taking the one dimensional heat-conduction equation as an example)
6th MAC type semi-explicit method for solving the transient flow equations of incompressible viscous liquid
7th Dynamic and kinematic condition at free surface / Capturing and keeping track of free surface
(N.Sekishita)

(T.Suzuki) Numerical analysis of the liquid flow with free surface
5th Introduction to finite differential method (Taking the one dimensional heat-conduction equation as an example)
6th MAC type semi-explicit method for solving the transient flow equations of incompressible viscous liquid
7th Dynamic and kinematic condition at free surface / Capturing and keeping track of free surface

Self Preparation and Review

Related subjects

(T.Suzuki) Basic knowledge of mathematics, hydrodynamics and heat-transfer is Prerequisite.

(T.Suzuki) Basic knowledge of mathematics, hydrodynamics and heat-transfer is Prerequisite.

Notes for textbook

(T.Suzuki) Handouts will be prepared for participants.

(T.Suzuki) Handouts will be prepared for participants.

Notes for reference

Goals to be achieved

Evaluation of achievement

(T.Suzuki) Class Report

(T.Suzuki) Class Report

Examination
Details of examination
Other information (T.Suzuki) D-308, Ext.6667, E-mail takashi@me.tut.ac.jp (T.Suzuki) D-308, Ext.6667, E-mail takashi@me.tut.ac.jp
Reference URL
Office hours
Relations to attainment objectives of learning and education
Key words

(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**	1～2
Department Offered	Mechanical Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering					

Objectives of class

This lecture aims to provide a broad understanding of the 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

Related subjects

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

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.

Coursework, presentation and/or report.

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Advanced Materials and Manufacturing Process II[Advanced Materials and Manufacturing Process II]				
Schedule number	M41630240	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Tue.4～4	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Mechanical Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering					

Objectives of class

This lecture aims to provide a broad understanding of the materials and manufacturing process available for the master thesis research work of a student.

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

Related subjects

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

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.

Coursework, presentation and/or report.

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Advanced System, Control and Robotics II[Advanced System, Control and Robotics II]				
Schedule number	M41630260	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Thu.4～4	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Mechanical Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering					

Objectives of class

This lecture aims to provide a broad understanding of the control and robotics available for the master thesis research work of a student.

This lecture aims to provide a broad understanding of the control and robotics available for the master thesis research work of a student.

Contents of class

The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.

The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.

Self Preparation and Review

Related subjects

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

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.

Coursework, presentation and/or report.

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Advanced Energy and Environmental Engineering II[Advanced Energy and Environmental Engineering II]				
Schedule number	M41630280	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Fri.3～3	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Mechanical Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering					

Objectives of class

This lecture aims to provide a broad understanding of the energy and environmental engineering available for the master thesis research work of a student.

This lecture aims to provide a broad understanding of the energy and environmental engineering available for the master thesis research work of a student.

Contents of class

The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.

The class provides both of fundamental knowledge of his/her master thesis research work and the most advanced results in the related field by reading research papers and monographs. The contents of the class depend on the supervisor. To be announced by individual supervisors.

Self Preparation and Review

Related subjects

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

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.

Coursework, presentation and/or report.

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(M41630310)Vibration Engineering[Vibration Engineering]

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

Objectives of class

The class aims to give basic knowledge on vibration engineering, in particular, on the modeling of multi-degree-of-freedom system and modal analysis.

The class aims to give basic knowledge on vibration engineering, in particular, on the modeling of multi-degree-of-freedom system and modal analysis.

Contents of class

Vibration Engineering(Kawamura)
1&2. Modeling of multi-degree-of-freedom system(MDOF system)
3&4. Modal analysis of MDOF system (eigenvalue analysis, etc.)
5-7. Modal analysis of MDOF system (Component mode synthesis method)

Vibration Engineering(Kawamura)
1&2. Modeling of multi-degree-of-freedom system(MDOF system)
3&4. Modal analysis of MDOF system (eigenvalue analysis, etc.)
5-7. Modal analysis of MDOF system (Component mode synthesis method)

Self Preparation and Review

Related subjects

Fundamental knowledge on vibration engineering and mathematics on linear algebra and ordinary differential equation, and engineering mechanics.

Fundamental knowledge on vibration engineering and mathematics on linear algebra and ordinary differential equation, and engineering mechanics.

Notes for textbook

Handouts will be prepared

Handouts will be prepared

Notes for reference

Goals to be achieved

get the basic knowledge on vibration engineering and some of their analytical methods.

get the basic knowledge on vibration engineering and some of their analytical methods.

Evaluation of achievement

Some short reports during the class (30%) and a comprehensive report after final class (70%)

Some short reports during the class (30%) and a comprehensive report after final class (70%)

Examination

レポートで実施
By Report

Details of examination

Other information

Shozo Kawamura: room (D-404), E-Mail: kawamura@me.tut.ac.jp

Shozo Kawamura: room (D-404), E-Mail: kawamura@me.tut.ac.jp

Reference URL

Office hours

ask me by E-Mail
ask me by E-Mail

Relations to attainment objectives of learning and education

Key words

vibration, modal analysis, Component modes Synthesis
vibration, modal analysis, Component modes Synthesis

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

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

Objectives of class

The thesis research aims to provide a practical experience of research work, and to acquire his/her research skill with deep understanding of the electrical and electronic engineering.

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 engineering.

Contents of class

The research subject depends on the supervisor and the research group you join. Individual students will have different research subjects. Contact with your supervisor.

The research subject depends on the supervisor and the research group you join. Individual students will have different research subjects. Contact with your supervisor.

Self Preparation and Review

Related subjects

Notes for textbook

Reference and material will be available from the supervisor.

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.

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.

Presentation, Thesis,Coursework, and Outcomes are evaluated generally.

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

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

Objectives of class

The 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.

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.

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.

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.

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.

Presentation, Thesis,Coursework, and Outcomes are evaluated generally.

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]				
Schedule number	M4261002T	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
Numbering					

Objectives of class

The thesis research aims to provide a practical experience of research work, and to acquire his/her research skill with deep understanding of the electrical and electronic information engineering.

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.

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.

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.

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.

Presentation, Thesis,Coursework, and Outcomes are evaluated generally.

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Seminar on Electrical and Electronic Information Engineering[Seminar on Electrical and Electronic Information Engineering]				
Schedule number	M42610040	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
Numbering					

Objectives of class

The seminar aims to provide a broad understanding of theoretical and experimental approoches related to the electrical and electronic information engineering for the research work of his/her master thesis.

The seminar aims to provide a broad understanding of theoretical and experimental approoches related to the electrical and electronic information engineering for the research work of his/her master thesis.

Contents of class

The class provides both of fundamental knowledge on the research work of master thesis and the most advanced results in the related field by reading research papers and monographs. Contents of the class depend on the supervisor. To be announced by individual supervisors.

The class provides both of fundamental knowledge on the research work of master thesis and the most advanced results in the related field by reading research papers and monographs. Contents of the class depend on the supervisor. To be announced by individual supervisors.

Self Preparation and Review

Related subjects

Notes for textbook

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

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

Notes for reference

Goals to be achieved

To acquire fundamental knowledge on individual research fields.

To acquire the ability of finding a problem, the ability of solving the problem and the presentation skill.

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.

Coursework, presentation and/or report.

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(M42630020)Physics for Electronics[Physics for Electronics]

Subject name[English]	Physics for Electronics[Physics for Electronics]				
Schedule number	M42630020	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Wed.2～2	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	松田　厚範, 服部　敏明, 高木　宏幸, 石山　武 MATSUDA Atsunori, HATTORI Toshiaki, TAKAGI Hiroyuki, ISHIYAMA Takeshi				
Numbering					

Objectives of class

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

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

Contents of class

"Physics for Electronics" is composed of four topics of functional materials, photonics, caloritronics, and spin electronics, which will be delivered for three times for each by four professors whose expertise lie on the individual categories.

The category of "Functional materials" is made to learn preparation, characterization and applications of functional materials for electronics and ionics based on physics and chemistry. The contents are 1) Fundamentals of amorphous and crystal, 2) Structure and property of glasses, 3) New preparation techniques of advanced materials, 4) Functional materials for ionis including Li-ion battery and fuel cell, and 5) Functional materials for optics including coatings, micro-optical components, and photonic devices.

The course of "photonics" is devoted to the understanding of interactions
between photon (light wave) and materials based on the quantum theory and also to industrial applications of photonic devices. 1) Physics and photonic devices, 2) dielectric function, plasmon, and polariton, 3) optical processes in semiconductors and exciton, 4) absorption and stimulated emission, 5) light wave modulation, 6) photonic devices update.

The category of "caloritronics" is made to learn mainly the interaction between heat and electron (carrier). The contents are 1) fundamentals of thermodynamics, 2) microstructure control and physical properties, 3) thermoelectronics, 4) thermoelectric materials, and 5) spin caloritronics.

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

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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 course of "photonics" is devoted to the understanding of interactions
between photon (light wave) and materials based on the quantum theory and also to industrial applications of photonic devices. 1) Physics and photonic devices, 2) dielectric function, plasmon, and polariton, 3) optical processes in semiconductors and exciton, 4) absorption and stimulated emission, 5) light wave modulation, 6) photonic devices update.

The category of "caloritronics" is made to learn mainly the interaction between heat and electron (carrier). The contents are 1) fundamentals of thermodynamics, 2) microstructure control and physical properties, 3) thermoelectronics, 4) thermoelectric materials, and 5) spin caloritronics.

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

Self Preparation and Review

Related subjects

Notes for textbook

None

None

Notes for reference

Goals to be achieved

(1) To understand fundamental aspects on functional materials, photonics and spin electronics.
(2) To get the knowledge on the latest technologies on these physical phenomena.

(1) To understand fundamental aspects on functional materials, photonics and spin electronics.
(2) To get the knowledge on the latest technologies on these physical phenomena.

Evaluation of achievement

Examination results 30% for each categories (functional materials, photonics, spin electronics) and 10% report, then the final evaluation will be the sum of these marks.

Examination results 30% for each categories (functional materials, photonics, spin electronics) and 10% report, then the final evaluation will be the sum of these marks.

Examination

試験期間中には何も行わない

None during exam period

Details of examination

Other information

Photonics; Mitsuo Fukuda : fukuda@ee.tut.ac.jp
Functional materials; Atsunori Matuda : matsuda@ee.tut.ac.jp
Caroritronics; Yuichi Nakamura : nakamura@ee.tut.ac.jp
Spin electronics: Hiroyuki Takagi : takagi@ee.tut.ac.jp

Photonics; Mitsuo Fukuda : fukuda@ee.tut.ac.jp
Functional materials; Atsunori Matuda : matsuda@ee.tut.ac.jp
Caroritronics; Yuichi Nakamura : nakamura@ee.tut.ac.jp
Spin electronics: Hiroyuki Takagi : takagi@ee.tut.ac.jp

Reference URL

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

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

Office hours

one hour after every classes

one hour after every classes

Relations to attainment objectives of learning and education

Key words

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

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

(M42630040)Electrical Technology and Materials[Electrical Technology and Materials]

Subject name[English]	Electrical Technology and Materials[Electrical Technology and Materials]				
Schedule number	M42630040	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Wed.1～1	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	須田 善行, 稲田 亮史, 村上 義信 SUDA Yoshiyuki, INADA Ryoji, MURAKAMI Yoshinobu				
Numbering					

Objectives of class

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

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

Contents of class

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

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

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

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

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

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

Self Preparation and Review

Related subjects

Basic electrical power engineering course is prerequisite.

Basic electrical power engineering course is prerequisite.

Notes for textbook

Materials will be prepared by the lecturer.

Materials will be prepared by the lecturer.

Notes for reference

Goals to be achieved

Evaluation of achievement Marks are based on reports(100%). Marks are based on reports(100%).
Examination
Details of examination
Other information
Reference URL (1) J. Larminie and A. Dicks: Fuel Cell Systems Explained (Wiley) (2) M. Yoshio, R.J. Brodd and A. Kozawa: Lithium Ion Batteries: Science and Technologies (Springer-Verlag) (3) E. Kuffel, W. Zaengel and J. Kuffel: High Voltage Engineering (Newnes) (1) J. Larminie and A. Dicks: Fuel Cell Systems Explained (Wiley) (2) M. Yoshio, R.J. Brodd and A. Kozawa: Lithium Ion Batteries: Science and Technologies (Springer-Verlag) (3) E. Kuffel, W. Zaengel and J. Kuffel: High Voltage Engineering (Newnes)
Office hours
Relations to attainment objectives of learning and education
Key words

(M42630050)Semiconductor Physics[Semiconductor Physics]

Subject name[English]	Semiconductor Physics[Semiconductor Physics]				
Schedule number	M42630050	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Tue.1～1	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	若原　昭浩, SANDHU ADARSH, 岡田　浩, 河野　剛士 WAKAHARA Akihiro, Sandhu Adarsh, OKADA Hiroshi, KAWANO Takeshi				
Numbering					

Objectives of class

To understand semiconductor physics, structure, design, and processing of advanced semiconductor devices.
To understand semiconductor physics, structure, design, and processing of advanced semiconductor devices.

Contents of class

This subject consists of two parts. The first half begins by introducing majority- and minority-carrier behavior in fundamental pn-junction and MOS structures. Injected minority carrier dynamics in semiconductors is also included. On the latter half, student choose one from following two topics.

1. Fabrication and characterization technology for Nanosturecture devices (Prof. Sandhu, Okada)
2. Band engineering and quantum effect devices (Prof. Wakahara)
3. Advanced MEMS/NEMS technologies(Prof. Kawano)

Adding to lectures by professors, in this subject, a case study is also conducted. Namely, students are required to give a presentation on researches on the given topics, and on design of devices that satisfies required specifications.

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2. Band engineering and quantum effect devices (Prof. Wakahara)
3. Advanced MEMS/NEMS technologies(Prof. Kawano)

Adding to lectures by professors, in this subject, a case study is also conducted. Namely, students are required to give a presentation on researches on the given topics, and on design of devices that satisfies required specifications.

Self Preparation and Review

Related subjects

Master's course: Semiconductor physics,

Master's course: Semiconductor physics,

Notes for textbook

S.M.Sze, Physics of Semiconductor Devices (Wiley)

Related references, data, printed matters will be given in the class.
S.M.Sze, Physics of Semiconductor Devices (Wiley)

Related references, data, printed matters will be given in the class.

Notes for reference

Goals to be achieved

You will be able to:
1. Deeply understand fundamental phenomena in semiconductors, and explain operation principle of basic semiconductor devices to master course students.
2. Design a essential part of semiconductor devcie that satisfies the given specification.
3. Investigate on given topics, and give a lecture on this.

You will be able to:
1. Deeply understand fundamental phenomena in semiconductors, and explain operation principle of basic semiconductor devices to master course students.
2. Design a essential part of semiconductor devcie that satisfies the given specification.
3. Investigate on given topics, and give a lecture on this.

Evaluation of achievement

Achievenemt of lectures of the case study, and writing research reports.

Achievenemt of lectures of the case study, and writing research reports.

Examination

Details of examination

Other information

Before choosing a sub-course, contact to following professors

Akihiro Wakahara：C-608 wakahara[at]ee.tut.ac.jp
Adarsh Sandhu ：EIIRIS sandhu[at]eiiris.tut.ac.jp
Hiroshi Okada：C-303B okada[at]ee.tut.ac.jp
Takeshi Kawano:C-603 kawano[at]ee.tut.ac.jp

Before choosing a sub-course, contact to following professors

Akihiro Wakahara：C-608 wakahara[at]ee.tut.ac.jp
Adarsh Sandhu ：EIIRIS sandhu[at]eiiris.tut.ac.jp
Hiroshi Okada：C-303B okada[at]ee.tut.ac.jp
Takeshi Kawano:C-603 kawano[at]ee.tut.ac.jp

Reference URL

http://www.int.ee.tut.ac.jp
http://www.eiiris.tut.ac.jp
http://www.int.ee.tut.ac.jp
http://www.eiiris.tut.ac.jp

Office hours

Relations to attainment objectives of learning and education

Key words

Solid-state electronics, semiconductor physics, laser diode, low-dimensional quantum devices
Solid-state electronics, semiconductor physics, laser diode, low-dimensional quantum devices

(M42630070)Information and Communication Technology[Information and Communication Technology]

Subject name[English]	Information and Communication Technology[Information and Communication Technology]				
Schedule number	M42630070	**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**	1～2
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	大平 孝, 上原 秀幸 OHIRA Takashi, UEHARA Hideyuki				
Numbering					

Objectives of class

Students select between the following two courses:
The first course is intended for learning how to design microwave circuits needed for advanced wireless communication systems and wireless power transmission systems. The distributed constant element theory is addressed to characterize linear circuits at high frequencies. Based on this technique, students challenge synthesis of a variety of microwave signal and power processing functions.
The second course is intended for learning the mechanism of medium access control and multi-hop communications for ad hoc and sensor networks. Students try to give solutions of the problems which cause performance degradation.
Students select between the following two courses:
The first course is intended for learning how to design microwave circuits needed for advanced wireless communication systems and wireless power transmission systems. The distributed constant element theory is addressed to characterize linear circuits at high frequencies. Based on this technique, students challenge synthesis of a variety of microwave signal and power processing functions.
The second course is intended for learning the mechanism of medium access control and multi-hop communications for ad hoc and sensor networks. Students try to give solutions of the problems which cause performance degradation.

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 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

Self Preparation and Review

Related subjects

Course 1:
Deep understanding on electromagnetic field theory, linear passive and reciprocal circuit theory, and sophisticated experience on complex and matrix mathematics are prerequisite.

Course 2:
The students who will take this course are supposed to have sufficient knowledge about the following; wireless digital modulation and demodulation, radio propagation characteristic, signal processing, probability, random variables and stochastic

process.
Course 1:
Deep understanding on electromagnetic field theory, linear passive and reciprocal circuit theory, and sophisticated experience on complex and matrix mathematics are prerequisite.

Course 2:
The students who will take this course are supposed to have sufficient knowledge about the following; wireless digital modulation and demodulation, radio propagation characteristic, signal processing, probability, random variables and stochastic process.

Notes for textbook

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

Course 2: Instruct in 1st class.
Course 1: Lecture on the blackboard without resorting to textbooks.

Course 2: Instruct in 1st class.

Notes for reference

Goals to be achieved

Course 1:
- Understand the distributed constant elements and concept of scattering matrix.
- Derive frequency responses on linear RF circuits exploiting Mizuhashi Smith chart.
- Characterize various kinds of high frequency functional circuits and compose them based upon given specifications.

Course 2:
- Understand the mechanism of medium access control and multi-hop communications
- Understand the characteristics of ad hoc and sensor networks
- Present a solution or a new application for the above

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

Course 2:
- Understand the mechanism of medium access control and multi-hop communications
- Understand the characteristics of ad hoc and sensor networks
- Present a solution or a new application for the above

Evaluation of achievement

Course 1: Marks are based on the final test.

Course 2: Marks are based on reports and presentations.
Course 1: Marks are based on the final test.

Course 2: Marks are based on reports and presentations.

Examination

定期試験を実施（対面）
Examination(Face to Face)

Details of examination

Other information

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

Reference URL

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

Office hours

Appoint a time slot via email
Appoint a time slot via email

Relations to attainment objectives of learning and education

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

(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**	1～2
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
Numbering					

Objectives of class

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

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

The class provides some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors

Self Preparation and Review

Related subjects

Notes for textbook

Reference and material will be available from the supervisor.

Reference and material will be available from the supervisor.

Notes for reference

Goals to be achieved

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

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.

Coursework and presentation are evaluated generally.

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(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**	1～2
Department Offered	Electrical and Electronic Information Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S3系教務委員 3kei kyomu Iin-S				
Numbering					

Objectives of class

The course is intended for students to study basic materials in depth, related to his/her research subjects in computer science and engineering.
It is also aimed for students to acquire various skills, required in general research work, such as those for oral presentation, and technical discussion and writing.

The course is intended for students to study basic materials in depth, related to his/her research subjects in computer science and engineering.
It is also aimed for students to acquire various skills, required in general research work, such as those for oral presentation, and technical discussion and writing.

Contents of class

While specific contents depend on the research areas students are involved in, it is usually the case for students to read relevant textbooks/research papers and report on them, as well as to present and discuss on the research work of their own.
While specific contents depend on the research areas students are involved in, it is usually the case for students to read relevant textbooks/research papers and report on them, as well as to present and discuss on the research work of their own.

Self Preparation and Review

Related subjects

Consult with your advisor.

Consult with your advisor.

Notes for textbook

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

Evaluation of achievement

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

Examination

Details of examination

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

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

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

Objectives of class

The seminar aims to provide a broad understanding of the computer science and engineering available for the research work of his/her master thesis.

The seminar aims to provide a broad understanding of the computer science and engineering available 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.

The class provides both of fundamental knowledge on the research work of master thesis and the most advanced results in the related field by reading research papers and monographs. Contents of the class depend on the supervisor. To be announced by individual supervisors.

Self Preparation and Review

Related subjects

Notes for textbook

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

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

Notes for reference

Goals to be achieved

To acquire fundamental knowledge on individual research fields, to acquire the ability of finding a problem, the ability of solving the problem and the presentation skill.

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.

Coursework, presentation and/or report.

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

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

Objectives of class

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

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.

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

Related subjects

Consult with your advisor for them.
Consult with your advisor for them.

Notes for textbook

Consult with your advisor for them.

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

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

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

Objectives of class

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

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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.

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

Related subjects

Consult with your advisor for them.
Consult with your advisor for them.

Notes for textbook

Consult with your advisor for them.

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

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

Subject name[English]	Thesis Research on Computer Science and Engineering[Thesis Research on Computer Science and Engineering]				
Schedule number	M4361003T	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Computer Science and Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S3系教務委員 3kei kyomu Iin-S				
Numbering					

Objectives of class

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

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.

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

Related subjects

Consult with your advisor for them.
Consult with your advisor for them.

Notes for textbook

Consult with your advisor for them.

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

(M43630020)System Design Project[System Design Project]

Subject name[English]	System Design Project[System Design Project]				
Schedule number	M43630020	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Tue.4 ～ 4,Fri.4 ～5	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Computer Science and Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S3系教務委員 3kei kyomu Iin-S				
Numbering					

Objectives of class

The project is intended for students to foster their interests in research problems on computer science and engineering and to acquire ability for independent studies.
It is also aimed for students to acquire design ability for their thesis research such as the purpose, the background knowledge, the research topic, the plan/schedule and to present the progress.

The project is intended for students to foster their interests in research problems on computer science and engineering and to acquire ability for independent studies.
It is also aimed for students to acquire design ability for their thesis research such as the purpose, the background knowledge, the research topic, the plan/schedule and to present the progress.

Contents of class

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

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

Self Preparation and Review

Related subjects

Consult with your advisor for them.
Consult with your advisor for them.

Notes for textbook

Consult with your advisor.
Consult with your advisor.

Notes for reference

Goals to be achieved

To acquire design abilities for doing research and development at technically high level and leading large scale research projects

To acquire design abilities for doing research and development at technically high level and leading large scale research projects

Evaluation of achievement

Will be evaluated by the poster presentation and report including the research purpose, background knowledge,research topic,plan/scheduling and progress.

Will be evaluated by the poster presentation and report including the research purpose, background knowledge,research topic,plan/scheduling and progress.

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

(M43630080)Computers and Education[Computers and Education]

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

Objectives of class

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

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

Contents of class

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

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

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

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

14.Simulated Classes #2
15.Simulated Classes #3
16.Presentations of Final Reports

Self Preparation and Review

Related subjects
Basic skills on information and communication technology are required.
Basic skills on information and communication technology are required.

Notes for textbook
(Reference) H. Ohiwa, et.al.: "JOUHOUKA KYOUIKUHOU", Ohm Sha, in Japanese.

(Reference) H. Ohiwa, et.al.: "JOUHOUKA KYOUIKUHOU", Ohm Sha, in Japanese.

Notes for reference

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

Evaluation of achievement
Written reports 50%, In class work 50%.
Written reports 50%, In class work 50%.

Examination

Details of examination

Other information
Room: F1-206.
E-Mail: kawai@tut.jp

Room: F1-206.
E-Mail: kawai@tut.jp

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

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

Relations to attainment objectives of learning and education

Key words
Informatics, Computer Literacy, Scientific Communication.
Informatics, Computer Literacy, Scientific Communication.

(M43630110)High Performance Computing[High Performance Computing]

Subject name[English]	High Performance Computing[High Performance Computing]				
Schedule number	M43630110	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Thu.3～3	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Computer Science and Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	後藤　仁志 GOTO Hitoshi				
Numbering					

Objectives of class

This lecture aims to lean the basic concepts and recent developments related to high-performance and cloud computing, simulation science and technology, and especially, to master parallel programming techniques for multi-core processor system and high-performance computing. Recent topics on computational chemistry will be also introduced for well-understanding the current technology of supercomputer and supercomputing. In order to conduct a practical training course on parallel programming techniques of OpenMP and OpenMPI, knowledge and ability to mathematical scientific programming techniques by using Fortran 90/95/2000 and/or C/C++ must be required for students taking this lecture.

This lecture aims to lean the basic concepts and recent developments related to high-performance and cloud computing, simulation science and technology, and especially, to master parallel programming techniques for multi-core processor system and high-performance computing. Recent topics on computational chemistry will be also introduced for well-understanding the current technology of supercomputer and supercomputing. In order to conduct a practical training course on parallel programming techniques of OpenMP and OpenMPI, knowledge and ability to mathematical scientific programming techniques by using Fortran 90/95/2000 and/or C/C++ must be required for students taking this lecture.

Contents of class

1. Guidance and placement examination
2. Introduction to simulation science: What's simulation?
3- 5. Partial differential equation of motion, pendulum, mechanical vibration and thier coupled (combined) behaviors
6. Introduction to molecular simulations
7- 9. Practical training of molecular simulations
10. Introduction to parallel programming (OpenMP and OpenMPI) and programming language (Fortran90/95/2000)
11-13. Practical training of parallel programming (practical beginner's guide)
14-16. Practical training of parallel programming (Intel(R) Compilers)

1. Guidance and placement examination
2. Introduction to simulation science: What's simulation?
3- 5. Partial differential equation of motion, pendulum, mechanical vibration and thier coupled (combined) behaviors
6. Introduction to molecular simulations
7- 9. Practical training of molecular simulations
10. Introduction to parallel programming (OpenMP and OpenMPI) and programming language (Fortran90/95/2000)
11-13. Practical training of parallel programming (practical beginner's guide)
14-16. Practical training of parallel programming (Intel(R) Compilers)

Self Preparation and Review

Related subjects

Fundamental knowledge of computation and chemistry, and also basic ability to scientific programming techniques by using Fortran 90/95/2000 and/or C/C++

Fundamental knowledge of computation and chemistry, and also basic ability to scientific programming techniques by using Fortran 90/95/2000 and/or C/C++

Notes for textbook

None

None

Notes for reference

Goals to be achieved

Advanced knowledge of simulation science, especially molecular simulations and high-level ability of programming technique in mathematics and science Advanced knowledge of simulation science, especially molecular simulations and high-level ability of programming technique in mathematics and science
Evaluation of achievement Reports on various topics and assignments Reports on various topics and assignments
Examination 試験期間中には何も行わない None during exam period
Details of examination
Other information via E-mail (gotoh@tut.jp) via E-mail (gotoh@tut.jp)
Reference URL
Office hours via E-mail(gotoh@tut.jp) via E-mail(gotoh@tut.jp)
Relations to attainment objectives of learning and education None None
Key words Computer Simulation, Computational Mathematics, Computational Physics,Computational Chemistry, Supercomputer, Mathematical Science Computer Simulation, Computational Mathematics, Computational Physics,Computational Chemistry, Supercomputer, Mathematical Science

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

Subject name[English]	Quantum Biology and Materials Science[Quantum Biology and Materials Science]				
Schedule number	M43630160	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Wed.1～1	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Computer Science and Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	関野　秀男, 栗田　典之, 後藤　仁志 SEKINO Hideo, KURITA Noriyuki, GOTO Hitoshi				
Numbering					

Objectives of class

Understanding of theories for molecular science and simulation technology based upon it
Understanding of theories for molecular science and simulation technology based upon it

Contents of class

1. Fundamental notion of quantum mechanics
i) Philosophical aspect
ii) Pragmatical aspect
2. Differential equations for quantum mechanical problems
i) Free particle
ii) Confined particle
iii) Multidimensional problems
3. Molecular orbital theory
i) Representation of physical space
ii) Spectral representation of space/ Basis functions
4. Approximate theory for many electron systems
i) Many particle problem in confined systems
ii) Rigor and precision
iii) Computational aspect

1. Fundamental notion of quantum mechanics
i) Philosophical aspect
ii) Pragmatical aspect
2. Differential equations for quantum mechanical problems
i) Free particle
ii) Confined particle
iii) Multidimensional problems
3. Molecular orbital theory
i) Representation of physical space
ii) Spectral representation of space/ Basis functions
4. Approximate theory for many electron systems
i) Many particle problem in confined systems
ii) Rigor and precision
iii) Computational aspect

Self Preparation and Review

Preparation is must. Student cannot stay in the class if not prepared for the class in advance.
Preparation is must. Student cannot stay in the class if not prepared for the class in advance.

Related subjects

Notes for textbook

1)Quantum chemistry
Eyring/Walter/Kimball

2)Modern Quantum Chemistry
Introduction to Advanced Electron Structure Theory

A.Szabo and N.S.Ostlund
1)Quantum chemistry
Eyring/Walter/Kimball

2)Modern Quantum Chemistry
Introduction to Advanced Electron Structure Theory
A.Szabo and N.S.Ostlund

Notes for reference

Goals to be achieved

To understand quantum mechanics, Molecuar quantum mechanics and its numerical representation on computer.
To understand quantum mechanics, Molecuar quantum mechanics and its numerical representation on computer.

Evaluation of achievement

Presentation in the class and reports, small tests(several times) as well as creation of simulation programs.
Presentation in the class and reports, small tests(several times) as well as creation of simulation programs.

Examination

その他
Other

Details of examination

Each class, student must show the results of the research project assigned for each.
Each class, student must show the results of the research project assigned for each.

Other information

F-305
0532-44-6880
F-305
0532-44-6880

Reference URL

Office hours

Wed. 13:00 to 14:30
Wed. 13:00 to 14:30

Relations to attainment objectives of learning and education

Key words

Molecular Orbital Theory　Differential Equation
Molecular Orbital Theory　Differential Equation

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

Subject name[English]	Speech and Language Processing, Advanced[Speech and Language Processing, Advanced]				
Schedule number	M43630220	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Thu.2～2	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Computer Science and Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	秋葉 友良, 山本 一公 AKIBA Tomoyoshi, YAMAMOTO Kazumasa				
Numbering					

Objectives of class

Important topics on spoken / natural language processing will be discussed.
Important topics on spoken / natural language processing will be discussed.

Contents of class

(Yamamoto)
Basic of spoken language processing / Basic of speech recognition / Algorithm for continuous speech recognition / Hidden Markov Model / Language model, parsing and decoder/ Spoken dialog systems/

(Akiba)
Basic of information retrieval / Basic of natural language processing / Algorithms for string matching and text indexing / Modeling methods for sentences and documents / Automatic machine translation

(Yamamoto)
Basic of spoken language processing / Basic of speech recognition / Algorithm for continuous speech recognition / Hidden Markov Model / Language model, parsing and decoder/ Spoken dialog systems/

(Akiba)
Basic of information retrieval / Basic of natural language processing / Algorithms for string matching and text indexing / Modeling methods for sentences and documents / Automatic machine translation

Self Preparation and Review

Related subjects

Information theory, Formal language theory
Information theory, Formal language theory

Notes for textbook

・M.Gales & S.Young
The application of hidden markov models in speech recognition,
World Scientific

・L.R. Rabiner, R.W. Schafer
Introduction to Digital Speech Processing
World Scientific

・Richado Baeza-Yates, Berthier Bibeiro-Neto
Modern Information Retrieval
Addison Wesley
・M.Gales & S.Young
The application of hidden markov models in speech recognition,
World Scientific

・L.R. Rabiner, R.W. Schafer
Introduction to Digital Speech Processing
World Scientific

・Richado Baeza-Yates, Berthier Bibeiro-Neto
Modern Information Retrieval
Addison Wesley

Notes for reference

Goals to be achieved

Basics: Understand the role of spoken language as an human interface / Understand hierarchical structure of spoken language / Understand the basic speech analysing methods. / Understand the basic concepts of information retrieval and natural language processing
Speech Recognition: Understand the relation between speech recognition and information theory / Understand the algorithm for speech recognition using DP matching / Understand the Hidden Markov Model.
Natural Language Processing: Understand the role of language model / Understand the parser for context free language. / Understand the character encoding scheme for the world wide letters. / Understand the string matching methods and text indexing methods. / Understand the computational models for sentences, documents, and cross-language relations.
Applications: Understand the dictation system and the speedh dialog system / Understand the applications of speech technology including computer aided language learning system. / Understand the machine translation system.

Basics: Understand the role of spoken language as an human interface / Understand hierarchical structure of spoken language / Understand the basic speech analysing methods. / Understand the basic concepts of information retrieval and natural language processing
Speech Recognition: Understand the relation between speech recognition and information theory / Understand the algorithm for speech recognition using DP matching / Understand the Hidden Markov Model.
Natural Language Processing: Understand the role of language model / Understand the parser for context free language. / Understand the character encoding scheme for the world wide letters. / Understand the string matching methods and text indexing methods. / Understand the computational models for sentences, documents, and cross-language relations.
Applications: Understand the dictation system and the speedh dialog system / Understand the applications of speech technology including computer aided language learning system. / Understand the machine translation system.

Evaluation of achievement

Marks are based on final examination (50%) and reports (50%).

Marks are based on final examination (50%) and reports (50%).

Examination

Details of examination

Other information

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

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

Reference URL

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

Office hours

16:25-17:40, Tuesday and Wednesday
16:25-17:40, Tuesday and Wednesday

Relations to attainment objectives of learning and education

Key words
spoken language processing, natural language processing, human language technology
spoken language processing, natural language processing, human language technology

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

Subject name[English]	Web Data Engineering 1[Web Data Engineering 1]				
Schedule number	M43630280	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Spring1 term	**Day of the week,period**	Thu.1～1	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Computer Science and Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	青野 雅樹 AONO Masaki				
Numbering					

Objectives of class

Massive data analysis on the Web will be discussed.
This lecture is composed of two parts. Part I deals with information retrieval and multimedia retrieval. Part II deals with data mining techniques, including principal component analysis, classification, clustering, machine learning. Web mining, and collective intelligence.
Massive data analysis on the Web will be discussed.
This lecture is composed of two parts. Part I deals with information retrieval and multimedia retrieval. Part II deals with data mining techniques, including principal component analysis, classification, clustering, machine learning. Web mining, and collective intelligence.

Contents of class

1. Information Retrieval
Fundamantal techniques to construct a search system is disccues, including how to build indices, how to tokenize texts, and hot wo extract features from texts, images, and other multimedia.
2. Data and Web Mining
Fundamental methods for data mining as well as Web mining are discussed.

We plan to do one or two assigments for constructing simple Web applications including data mining techniques inside.

Please note that if this lecture is held at the same time with Japanese course, the lecture might be in Japanese.
1. Information Retrieval
Fundamantal techniques to construct a search system is disccues, including how to build indices, how to tokenize texts, and hot wo extract features from texts, images, and other multimedia.
2. Data and Web Mining
Fundamental methods for data mining as well as Web mining are discussed.

We plan to do one or two assigments for constructing simple Web applications including data mining techniques inside.

Please note that if this lecture is held at the same time with Japanese course, the lecture might be in Japanese.

Self Preparation and Review

It is desirable to self-study as well as review fundamental data mining techniques such as clustering, classification, principal component analysis, and regression. It is recommended installing R language into your computer, because some of lecture materials are written in R language.
It is desirable to self-study as well as review fundamental data mining techniques such as clustering, classification, principal component analysis, and regression. It is recommended installing R language into your computer, because some of lecture materials are written in R language.

Related subjects

Notes for textbook

Materials will be prepared by lecturers
References:
(1) C.D. Manning et al, Intoroduction to Information Retrieval, Cambridge Univ. Press
(2) J.Han and M. Kamber, Data Mining: Concepts and Techniques, 2nd ed, Morgan Kaufmann

Materials will be prepared by lecturers
References:
(1) C.D. Manning et al, Intoroduction to Information Retrieval, Cambridge Univ. Press
(2) J.Han and M. Kamber, Data Mining: Concepts and Techniques, 2nd ed, Morgan Kaufmann

Reference1	**Book title**	Intoroduction to Information Retrieval			**ISBN**	
	Author		**Publisher**		**Publish year**	
Reference2	**Book title**	Data Mining: Concepts and Techniques, 2nd ed			**ISBN**	
	Author		**Publisher**		**Publish year**	

Notes for reference

Goals to be achieved
Obtain the following capabilities that can
1. Implement Web-service systems for handling a large data set.
2. Understand advanced aspects of data minig and information retrieval.
3. Design, analyze, and evaluate the Web-based system for mining huge data.
Obtain the following capabilities that can
1. Implement Web-service systems for handling a large data set.
2. Understand advanced aspects of data minig and information retrieval.
3. Design, analyze, and evaluate the Web-based system for mining huge data.

Evaluation of achievement
Exercise (20%) and final exam (80%)

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

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

Details of examination

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

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

Reference URL
http://www.kde.cs.tut.ac.jp/~aono/myLecture.html
http://www.kde.cs.tut.ac.jp/~aono/myLecture.html

Office hours
Anytime, but a priori email appointment is definitely preferable.
Anytime, but a priori email appointment is definitely preferable.

Relations to attainment objectives of learning and education
Capability of designing Web application systems.
Programming skills with Java, C++, R, and Python might be preferable.

Capability of designing Web application systems.
Programming skills with Java, C++, R, and Python might be preferable.

Key words

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

Subject name[English]	Bio-physical Information Systems 1[Bio-physical Information Systems 1]				
Schedule number	M43630320	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Spring1 term	**Day of the week,period**	Fri.2～2	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Computer Science and Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	福村　直博 FUKUMURA Naohiro				
Numbering					

Objectives of class

This course lectures on advanced studies on information processing in the nervous systems and computational models for motor controls of the human voluntary movements.
This course lectures on advanced studies on information processing in the nervous systems and computational models for motor controls of the human voluntary movements.

Contents of class

1. Introduction to the computational neuroscience in the motor control system
2. Information processing in the motor system of the brain
3-4. Motor control models of the human arm movements
5-6. Models for motor planning in the human arm movements
7. Models for motor planning in the human hand movements
8. Examination

1. Introduction to the computational neuroscience in the motor control system
2. Information processing in the motor system of the brain
3-4. Motor control models of the human arm movements
5-6. Models for motor planning in the human arm movements
7. Models for motor planning in the human hand movements
8. Examination

Self Preparation and Review

Related subjects

Notes for textbook

References:
Human Motor Control (David A. Rosenbaum, Academic Press, 2010)
The Coputational Neurobiology of Reaching and Pointing (Reza Shadmehr and Steven P.Wise 2005)
Hand and Brain (Alan M.Wing, Patrick Haggard, and J. Flanagan, Academic Press, 1996)
References:
Human Motor Control (David A. Rosenbaum, Academic Press, 2010)
The Coputational Neurobiology of Reaching and Pointing (Reza Shadmehr and Steven P.Wise 2005)
Hand and Brain (Alan M.Wing, Patrick Haggard, and J. Flanagan, Academic Press, 1996)

Notes for reference

Goals to be achieved

1. Understand the computational processing in the motor control
2. Understand the motor control models of the human voluntary movements
3. Understand the models for motor planning of the human voluntary movements
1. Understand the computational processing in the motor control
2. Understand the motor control models of the human voluntary movements
3. Understand the models for motor planning of the human voluntary movements

Evaluation of achievement

Final examination (100%), A: 100-80, B: 79-65, C: 64-55, D (fail): 54-0
Final examination (100%), A: 100-80, B: 79-65, C: 64-55, D (fail): 54-0

Examination
Details of examination
Other information N. Fukumura (C611, Tel: 0532-44-6772, fukumura@cs.tut.ac.jp) N. Fukumura (C611, Tel: 0532-44-6772, fukumura@cs.tut.ac.jp)
Reference URL http://www.bmcs.cs.tut.ac.jp http://www.bmcs.cs.tut.ac.jp
Office hours Friday 16:20-17:50 Friday 16:20-17:50
Relations to attainment objectives of learning and education D1 D1
Key words

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

Subject name[English]	Bio-physical Information Systems 2[Bio-physical Information Systems 2]				
Schedule number	M43630330	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Fri.2～2	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Computer Science and Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	堀川　順生 HORIKAWA Junsei				
Numbering					

Objectives of class

This course lectures on information processing in the nervous systems of animals and humans. The structures of the nervous systems, mechanisms of neural and synaptic transmissions of electrical signals, and mechanisms of sensory information processing in the peripheral and central nervous systems are studied.

This course lectures on information processing in the nervous systems of animals and humans. The structures of the nervous systems, mechanisms of neural and synaptic transmissions of electrical signals, and mechanisms of sensory information processing in the peripheral and central nervous systems are studied.

Contents of class

1. Introduction to the information processing in the nervous system
2. Structures of neurons and the peripheral and central nervous systems
3. Action potentials and synaptic transmission
4-5. Information processing in the visual system
6. Information processing in the auditory system
7. Information processing in the somatosensory systems
8. Final examination

1. Introduction to the information processing in the nervous system
2. Structures of neurons and the peripheral and central nervous systems
3. Action potentials and synaptic transmission
4-5. Information processing in the visual system
6. Information processing in the auditory system
7. Information processing in the somatosensory systems
8. Final examination

Self Preparation and Review

Related subjects

Bio-physical Information Systems 1

Bio-physical Information Systems 1

Notes for textbook

References:

Neuroscience – Exploring the brain (Bear, Connors, Paradiso, Lippincott Williams & Wilkins 2007), Cognitive Neuroscience – The biology of the brain (Gazzaniga, Ivry, Mangun, WW Norton & Co Incm 2008)

References:

Neuroscience – Exploring the brain (Bear, Connors, Paradiso, Lippincott Williams & Wilkins 2007), Cognitive Neuroscience – The biology of the brain (Gazzaniga, Ivry, Mangun, WW Norton & Co Incm 2008)

Notes for reference

Goals to be achieved

1. Understand the structures of neurons and the peripheral and central nervous systems
2. Understand neural and synaptic mechanisms for information processing and Hodgekin-Huxley equation
3. Understand the neural information processing in the visual, auditory and somatosensory systems

1. Understand the structures of neurons and the peripheral and central nervous systems
2. Understand neural and synaptic mechanisms for information processing and Hodgekin-Huxley equation
3. Understand the neural information processing in the visual, auditory and somatosensory systems

Evaluation of achievement

Final examination (100%), A: 100-80, B: 79-65, C: 64-55, D (fail): 54-0

Final examination (100%), A: 100-80, B: 79-65, C: 64-55, D (fail): 54-0

Examination

Details of examination

Other information

Junsei Horikawa (F407, Tel: 0532-44-6891, horikawa@cs.tut.ac.jp)

Junsei Horikawa (F407, Tel: 0532-44-6891, horikawa@cs.tut.ac.jp)

Reference URL

Office hours

Friday 16:20-17:50

Friday 16:20-17:50

Relations to attainment objectives of learning and education

D1

D1

Key words

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

Subject name[English]	Seminar on Environmental and Life Science I[Seminar on Environmental and Life Science I]				
Schedule number	M44610010	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	3
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering					

Objectives of class

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

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

Contents of class

The students will be required to read textbooks and papers written by other language than Japanese, especially English, which are suggested by his/her supervisor, and to report and discuss deeply on his/her research subject in the seminar.

The students will be required to read textbooks and papers written by other language than Japanese, especially English, which are suggested by his/her supervisor, and to report and discuss deeply on his/her research subject in the seminar.

Self Preparation and Review

Related subjects

Seminar on Environmental and Life Science II
Thesis Research on Environmental and Life Science
All other relevant subjects in Advanced Environmental and Life Sciences

Seminar on Environmental and Life Science II
Thesis Research on Environmental and Life Science
All other relevant subjects in Advanced Environmental and Life Sciences

Notes for textbook

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

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

Notes for reference

Goals to be achieved

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

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

Evaluation of achievement

The evaluation is based on the scores of reading textbooks and scientific papers, discussions, reports and presentations of his/her research in the seminar. His/her supervisor evaluates the scores.

The evaluation is based on the scores of reading textbooks and scientific papers, discussions, reports and presentations of his/her research in the seminar. His/her supervisor evaluates the scores.

Examination

Details of examination

Other information

Supervisor(s)
Supervisor(s)

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

Office hours
Students are encouraged visiting by appointment.
Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

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

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

Subject name[English]	Seminar on Environmental and Life Science II[Seminar on Environmental and Life Science II]				
Schedule number	M44610020	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	3
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering					

Objectives of class

Based on the Seminar on Environmental and Life Science I, this course will further provide the students with the opportunity to study on his/her research subject in environmental and life sciences by reading textbooks and papers under the guidance of his/her supervisor. The students will learn the knowledge and the presentation skills required for his/her research in the seminar.

Based on the Seminar on Environmental and Life Science I, this course will further provide the students with the opportunity to study on his/her research subject in environmental and life sciences by reading textbooks and papers under the guidance of his/her supervisor. The students will learn the knowledge and the presentation skills required for his/her research in the seminar.

Contents of class

The students will be required to read textbooks and papers written by other language than Japanese, especially English, which are suggested by his/her supervisor, and to report and discuss deeply on his/her research subject in the seminar.

The students will be required to read textbooks and papers written by other language than Japanese, especially English, which are suggested by his/her supervisor, and to report and discuss deeply on his/her research subject in the seminar.

Self Preparation and Review

Related subjects

Seminar on Environmental and Life Science I
Thesis Research on Environmental and Life Science
All other relevant subjects in Advanced Environmental and Life Sciences

Seminar on Environmental and Life Science I
Thesis Research on Environmental and Life Science
All other relevant subjects in Advanced Environmental and Life Sciences

Notes for textbook

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

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

Notes for reference

Goals to be achieved

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

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

Evaluation of achievement

The evaluation is based on the scores of reading textbooks and scientific papers, discussions, reports and presentations of his/her research in the seminar. His/her supervisor evaluates the scores.

The evaluation is based on the scores of reading textbooks and scientific papers, discussions, reports and presentations of his/her research in the seminar. His/her supervisor evaluates the scores.

Examination

Details of examination

Other information

Supervisor(s)
Supervisor(s)

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

Office hours
Students are encouraged visiting by appointment.
Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

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

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

Subject name[English]	Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]				
Schedule number	M44610030	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Required
Time of starting a course	2Years	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S4系教務委員, 各教員 4kei kyomu Iin-S, KAKUKYOUIN Kakukyouin				
Numbering					

Objectives of class

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

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

Contents of class

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

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

Self Preparation and Review

Related subjects

Seminar on Environmental and Life Science I
Seminar on Environmental and Life Science II
All other relevant subjects in Advanced Environmental and Life Sciences

Seminar on Environmental and Life Science I
Seminar on Environmental and Life Science II
All other relevant subjects in Advanced Environmental and Life Sciences

Notes for textbook

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

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

Notes for reference

Goals to be achieved

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

To acquire basic knowledge on environmental and life sciences
To master experimental techniques and analytical skills required for research on a given field of environmental and life sciences
To be able to present and discuss on the results of his/her research

To be able to make safety control in experimental work

Evaluation of achievement

The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).

The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).

Examination

Details of examination

Other information

Supervisor(s)

Supervisor(s)

Reference URL

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

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

Office hours

Students are encouraged visiting by appointment.

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

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

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

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

Subject name[English]	Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]				
Schedule number	M44610030	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Required
Time of starting a course	2Years	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	M1, M2
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering					

Objectives of class

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

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

Contents of class

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

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

Self Preparation and Review

Related subjects

Seminar on Environmental and Life Science I
Seminar on Environmental and Life Science II
Seminar on Environmental and Life Science I
Seminar on Environmental and Life Science II

Notes for textbook

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

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

Notes for reference

Goals to be achieved

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

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

Evaluation of achievement

The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).
The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).

Examination

Details of examination

Other information

Supervisor
Supervisor

Reference URL

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

Office hours

Students are encouraged visiting by appointment.
Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

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

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

Subject name[English]	Thesis Research on Environmental and Life Science[Thesis Research on Environmental and Life Science]				
Schedule number	M4461003T	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering					

Objectives of class

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

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

Contents of class

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

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

Self Preparation and Review

Related subjects

Seminar on Environmental and Life Science I
Seminar on Environmental and Life Science II
Seminar on Environmental and Life Science I
Seminar on Environmental and Life Science II

Notes for textbook

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

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

Notes for reference

Goals to be achieved

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

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

Evaluation of achievement

The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).
The score of the course is based on his/her Master's Thesis and the presentation in the final review of his/her Master's Thesis (the quality of his/her research, presentation skills, discussions and answering the questions on his/her presentation etc).

Examination

Details of examination

Other information

Supervisor(s)
Supervisor(s)

Reference URL

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

Office hours

Students are encouraged visiting by appointment.
Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

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

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

Subject name[English]	Seminar on Environmental and Life Science[Seminar on Environmental and Life Science]				
Schedule number	M44610040	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering					

Objectives of class

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

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

Contents of class

The students will be required to read textbooks and papers written by other language than Japanese, especially English, which are suggested by his/her supervisor, and to report and discuss deeply on his/her research subject in the seminar.

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

Notes for textbook

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

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

Notes for reference

Goals to be achieved

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

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

Evaluation of achievement

The evaluation is based on the scores of reading textbooks and scientific papers, discussions, reports and presentations of his/her research in the seminar. His/her supervisor evaluates the scores.

The evaluation is based on the scores of reading textbooks and scientific papers, discussions, reports and presentations of his/her research in the seminar. His/her supervisor evaluates the scores.

Examination

Details of examination

Other information

Supervisor(s)

Supervisor(s)

Reference URL

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

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

Office hours

Students are encouraged visiting by appointment.

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

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

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

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

Subject name[English]	Applied Physical Chemistry I[Applied Physical Chemistry I]				
Schedule number	M44630050	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Spring1 term	**Day of the week,period**	Tue.4～4	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	松本 明彦 MATSUMOTO Akihiko				
Numbering					

Objectives of class

Intermolecular interaction plays a key role in interfacial characteristics such as a mechanical property of composite materials, adsorption and separation features of molecules by porous solids. This course deals with fundamental aspect of the composite materials and basic principle of the intermolecular interaction. The adsorption and separation phenomena are also implemented based on the molecular interaction.

Intermolecular interaction plays a key role in interfacial characteristics such as a mechanical property of composite materials, adsorption and separation features of molecules by porous solids. This course deals with fundamental aspect of the composite materials and basic principle of the intermolecular interaction. The adsorption and separation phenomena are also implemented based on the molecular interaction.

Contents of class

1.Composite materials overview
2.Formation of interface and interfacial free energy
3.Molecular interaction
3-1 Electrostatic interaction, 3-2 Orientation interaction, 3-3 Induced interaction 3-4 Dispersion interaction
4.Adsorption and related phenomena
5.Control of interface interaction by regulation of the chemical structure of the interface

1.Composite materials overview
2.Formation of interface and interfacial free energy
3.Molecular interaction
3-1 Electrostatic interaction, 3-2 Orientation interaction, 3-3 Induced interaction 3-4 Dispersion interaction
4.Adsorption and related phenomena
5.Control of interface interaction by regulation of the chemical structure of the interface

Self Preparation and Review

Related subjects

Basic understanding on physical chemistry is desirable.

Basic understanding on physical chemistry is desirable.

Notes for textbook

Reference handouts will be provided in the class.

(Reference books)
[For molecular interaction]
1. J. N. Israelachivili Intermolecular and Surface Forces, 3rd Ed., Academic Press (2011).
2. Interface chemistry: D. H. Everett, Basic Principles of Colloid Science, Royal Society of Chemistry(1988).

[For adsorption]
1. F. Rouquerol, J. Rouquerol and K.S.W. Sing, Adsorption by Powders and Porous solids, Academic Press (1999)
Reference handouts will be provided in the class.

(Reference books)

[For molecular interaction]
1. J. N. Israelachivili Intermolecular and Surface Forces, 3rd Ed., Academic Press (2011).
2. Interface chemistry: D. H. Everett, Basic Principles of Colloid Science, Royal Society of Chemistry(1988).

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

Notes for reference

Goals to be achieved

Evaluation of achievement

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

Examination

レポートで実施
By Report

Details of examination

Other information

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

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(M44630060)Applied Physical Chemistry II[Applied Physical Chemistry II]

Subject name[English]	Applied Physical Chemistry II[Applied Physical Chemistry II]				
Schedule number	M44630060	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Tue.4～4	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	松本　明彦 MATSUMOTO Akihiko				
Numbering					

Objectives of class

Intermolecular interaction plays a key role in interfacial characteristics such as a mechanical property of composite materials, adsorption and separation features of molecules by porous solids. This course deals with fundamental aspects of the composite materials and features of the intermolecular interaction. The adsorption and separation phenomena are also implemented based on the molecular interaction.

Intermolecular interaction plays a key role in interfacial characteristics such as a mechanical property of composite materials, adsorption and separation features of molecules by porous solids. This course deals with fundamental aspects of the composite materials and features of the intermolecular interaction. The adsorption and separation phenomena are also implemented based on the molecular interaction.

Contents of class

1.Composite materials overview
2.Formation of interface and interfacial free energy
3.Molecular interaction
3-1 Electrostatic interaction, 3-2 Orientation interaction, 3-3 Induced interaction 3-4 Dispersion interaction
4.Adsorption and related phenomena
5.Control of interface interaction by regulation of the chemical structure of the interface

1.Composite materials overview
2.Formation of interface and interfacial free energy
3.Molecular interaction
3-1 Electrostatic interaction, 3-2 Orientation interaction, 3-3 Induced interaction 3-4 Dispersion interaction
4.Adsorption and related phenomena
5.Control of interface interaction by regulation of the chemical structure of the interface

Self Preparation and Review

Related subjects

Basic understanding on physical chemistry is desirable.

Basic understanding on physical chemistry is desirable.

Notes for textbook

Reference handouts will be provided in the class.

(Reference books)
[For molecular interaction]
1. J. N. Israelachivili Intermolecular and Surface Forces, 3rd Ed., Academic Press (2011).
2. Interface chemistry: D. H. Everett, Basic Principles of Colloid Science, Royal Society of Chemistry(1988).

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

Reference handouts will be provided in the class.

(Reference books)

[For molecular interaction]
1. J. N. Israelachivili Intermolecular and Surface Forces, 3rd Ed., Academic Press (2011).
2. Interface chemistry: D. H. Everett, Basic Principles of Colloid Science, Royal Society of Chemistry(1988).

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

Notes for reference

Goals to be achieved

1. Understanding of fundamental aspects of composite materials
2. Understanding of features of the intermolecular interaction
3. Understanding of general aspects of adsorption and separation phenomena
1. Understanding of fundamental aspects of composite materials
2. Understanding of features of the intermolecular interaction
3. Understanding of general aspects of adsorption and separation phenomena

Evaluation of achievement

Grade point will be evaluated by homework report (30%) and final examination or report (70%).

Grade point will be evaluated by homework report (30%) and final examination or report (70%).

Examination

その他
Other

Details of examination

Grade point will be evaluated by homework report (30%) and final examination or report (70%).
Grade point will be evaluated by homework report (30%) and final examination or report (70%).

Other information

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

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Special Topics in Applied Organic Chemistry[Special Topics in Applied Organic Chemistry]				
Schedule number	M44630100	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Spring1 term	**Day of the week,period**	Tue.5～5	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	岩佐 精二 IWASA Seiji				
Numbering					

Objectives of class

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

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.
2. Advanced modern synthetic organic reactions using transition metals.
3. Basic concept of oxidative addition and reductive elimination in catalytic cycles.
4. Synthetic applications of asymmetric synthesis and asymmetric catalysts.
5. Advanced homogeneous catalysts in industries.
6. Advanced reactions using typical elements.

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.
2. Advanced modern synthetic organic reactions using transition metals.
3. Basic concept of oxidative addition and reductive elimination in catalytic cycles.
4. Synthetic applications of asymmetric synthesis and asymmetric catalysts.
5. Advanced homogeneous catalysts in industries.
6. Advanced reactions using typical elements.

Self Preparation and Review

Related subjects

Subjects related to Organic Chemistry

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.

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.

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.
The report on papers from scientific journals such as J.A.C.S and Angew. Chem. will be imposed.
A design of novel organic molecular material.

Examination

Details of examination

Other information

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

Reference URL

http://material.tutms.tut.ac.jp/STAFF/IWASA/index.html.ja
http://ens.tut.ac.jp/orgchem/
http://material.tutms.tut.ac.jp/STAFF/IWASA/index.html.ja
http://ens.tut.ac.jp/orgchem/

Office hours

Relations to attainment objectives of learning and education

Key words

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

(M44630110)Developmental Neuroscience[Developmental Neuroscience]

Subject name[English]	Developmental Neuroscience[Developmental Neuroscience]				
Schedule number	M44630110	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Thu.2～2	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	吉田　祥子 YOSHIDA Sachiko				
Numbering					

Objectives of class

Objective of class is to develop a new technology for detection of neuronal function in your brain. We deal with neuronal property and development of neuronal circuit, and discuss applicability and problem of your ideas.

Objective of class is to develop a new technology for detection of neuronal function in your brain. We deal with neuronal property and development of neuronal circuit, and discuss applicability and problem of your ideas.

Contents of class

(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

(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

Self Preparation and Review

Related subjects

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

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

Notes for textbook

Web-based text will be distributed.

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

Web-based text will be distributed.

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

Notes for reference

Goals to be achieved

Evaluation of achievement

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

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

Examination

Details of examination

Other information Room: B-406, E-mail:syoshida@ens.tut.ac.jp Room: B-406, E-mail:syoshida@ens.tut.ac.jp
Reference URL https://moodle.imc.tut.ac.jp/ https://moodle.imc.tut.ac.jp/
Office hours
Relations to attainment objectives of learning and education
Key words

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

Subject name[English]	Advanced Electrical and Electronic Technology for Ecological Engineering[Advanced Electrical and Electronic Technology for Ecological Engineering]				
Schedule number	M44630140	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Spring1 term	**Day of the week,period**	Fri.4～4	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	田中　三郎, 水野　彰, 髙島　和則 TANAKA Saburo, MIZUNO Akira, TAKASHIMA Kazunori				
Numbering					

Objectives of class

Electrostatics and high voltage engineering have been applied in various environmental technologies. Purpose of this lecture is to understand the theoretical background and their applications in environmental and in bio-technologies

Electrostatics and high voltage engineering have been applied in various environmental technologies. Purpose of this lecture is to understand the theoretical background and their applications in environmental and in bio-technologies

Contents of class

1. Fundamental of Electrostatics （4 hours）
1.1 Charge and electric field
1.2 Electrostatic force
1.3 Gaseous discharge
1.4 Electrostatic precipitation
2. Industrial Applications of Atmospheric Non-Thermal Plasma in Environmental Remediation （4 hours）
2.1 ESP to NTP; Pulsed corona for abatement of back corona
2.2 Examples of NTP processes
DeNOx, Odor removal system
2.3 Combination of NTP with catalyst
Indoor air cleaning, Decomposition of VOCs, DeNOx for Diesel Exhaust
2.4 NTP with liquid
Wet-type plasma reactor, Electrolysis with NTP
2.5 NTP for fuel reforming

3. Generation of Non-thermal Plasma （2 hours）
3.1 Pulsed streamer corona
3.2 Dielectric barrier discharge and Packed bed
3.3 Surface dischargef and Honeycomb discharge
4. Various applications of NTP (2hours)
4.1 DeNOx
4.2 Indoor air cleaning
4.3 Plasma assisted combustion of VOC
4.4 Ammonia production from solid urea using non-thermal plasma
4.5 Oxidation Process of Xylene in Air using TiO2 and Ag/TiO2 under Electron Beam Irradiation
4.6 Conversion of hydro-carbon
5. Performance Evaluation and Economy of NTP Process (1 hour)
6. NTP and Spark discharge in Liquid （1 hour)
-Spark discharge in water as a new UV-H2O2 technology
-Liquid phase fuel reforming at room temperature using non-thermal plasma
7. NTP for bio-contamination control (1hour)
-Sterilization using a wide-gap discharge under atmospheric pressure
-Culturing of Cells as Influenced by Exposure to AC and DC Fields
-Lethal effect on microbes and viruses
-Safety evaluation using single DNA molecules

1. Fundamental of Electrostatics （4 hours）
1.1 Charge and electric field

1.2 Electrostatic force
1.3 Gaseous discharge
1.4 Electrostatic precipitation
2. Industrial Applications of Atmospheric Non-Thermal Plasma in Environmental Remediation （4 hours）
2.1 ESP to NTP; Pulsed corona for abatement of back corona
2.2 Examples of NTP processes
DeNOx, Odor removal system
2.3 Combination of NTP with catalyst
Indoor air cleaning, Decomposition of VOCs, DeNOx for Diesel Exhaust
2.4 NTP with liquid
Wet-type plasma reactor, Electrolysis with NTP
2.5 NTP for fuel reforming

3. Generation of Non-thermal Plasma （2 hours）
3.1 Pulsed streamer corona
3.2 Dielectric barrier discharge and Packed bed
3.3 Surface dischargef and Honeycomb discharge
4. Various applications of NTP (2hours)
4.1 DeNOx
4.2 Indoor air cleaning
4.3 Plasma assisted combustion of VOC
4.4 Ammonia production from solid urea using non-thermal plasma
4.5 Oxidation Process of Xylene in Air using TiO2 and Ag/TiO2 under Electron Beam Irradiation
4.6 Conversion of hydro-carbon
5. Performance Evaluation and Economy of NTP Process (1 hour)
6. NTP and Spark discharge in Liquid （1 hour)
-Spark discharge in water as a new UV-H2O2 technology
-Liquid phase fuel reforming at room temperature using non-thermal plasma
7. NTP for bio-contamination control (1hour)
-Sterilization using a wide-gap discharge under atmospheric pressure
-Culturing of Cells as Influenced by Exposure to AC and DC Fields
-Lethal effect on microbes and viruses
-Safety evaluation using single DNA molecules

Self Preparation and Review

Related subjects

Notes for textbook
Texts will be provided
Texts will be provided

Notes for reference

Goals to be achieved

Evaluation of achievement
Evaluation will be made by reports in each chapter
Evaluation will be made by reports in each chapter

Examination

Details of examination

Other information
mizuno@ens.tut.ac.jp

mizuno@ens.tut.ac.jp

Reference URL
http://ens.tut.ac.jp/electrostatics/
http://ens.tut.ac.jp/electrostatics/

Office hours Office hour is not regular, and appointment is required. Office hour is not regular, and appointment is required.
Relations to attainment objectives of learning and education
Key words

(M44630160)Advanced Eco-Materials Engineering[Advanced Eco-Materials Engineering]

Subject name[English]	Advanced Eco-Materials Engineering[Advanced Eco-Materials Engineering]				
Schedule number	M44630160	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Fri.5～5	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	辻 秀人 TSUJI Hideto				
Numbering					

Objectives of class

The Eco-Materials Engineering is developed and studied for reducing the environmental impact. The aim of this course is to allow the student to achieve understanding basic concept of the biobased and biodegradable polymers.

The Eco-Materials Engineering is developed and studied for reducing the environmental impact. The aim of this course is to allow the student to achieve understanding basic concept of the biobased and biodegradable polymers.

Contents of class

This course deals with all the aspects of the biobased and biodegradable polymers for reducing the impact on the environmental. The detailed course schedule is shown below:
(1) Introduction, (2) Synthesis, (3) Molding, (4) Crystallization, (5) Structure, (6) Physical properties, (7) Hydrolytic degradation, (8) Biodegradation, and (9) Applications.

This course deals with all the aspects of the biobased and biodegradable polymers for reducing the impact on the environmental. The detailed course schedule is shown below:
(1) Introduction, (2) Synthesis, (3) Molding, (4) Crystallization, (5) Structure, (6) Physical properties, (7) Hydrolytic degradation, (8) Biodegradation, and (9) Applications.

Self Preparation and Review

Related subjects

Notes for textbook

Printed materials from Biopolymers vol. 4 (Polyesters III), Y. Doi, A. Steinbuchel Eds., Wiley-VCH, 2002

Printed materials from Biopolymers vol. 4 (Polyesters III), Y. Doi, A. Steinbuchel Eds., Wiley-VCH, 2002

Notes for reference

Goals to be achieved

Evaluation of achievement

Reports and presentation

Reports and presentation

Examination

Details of examination

Other information

Phone: 6922, email: tsuji@ens.tut.ac.jp (Hideto Tsuji)

Phone: 6922, email: tsuji@ens.tut.ac.jp (Hideto Tsuji)

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(M44630180)Advanced Reaction Engineering[Advanced Reaction Engineering]

Subject name[English]	Advanced Reaction Engineering[Advanced Reaction Engineering]				
Schedule number	M44630180	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Spring1 term	**Day of the week,period**	Tue.2～2	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	小口 達夫 OGUCHI Tatsuo				
Numbering					

Objectives of class

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

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

Contents of class

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

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

Self Preparation and Review

Related subjects

Notes for textbook

(Reference book)
Paul L. Houston, "Chemical Kinetics and Reaction Dynamics", McGrawHill.

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

(Reference book)
Paul L. Houston, "Chemical Kinetics and Reaction Dynamics", McGrawHill.

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

Notes for reference

Goals to be achieved

Understanding reaction rate theory, reaction mechanisms.

Understanding reaction rate theory, reaction mechanisms.

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

(M44630190)Advanced Sustainable Coordinator[Advanced Sustainable Coordinator]

Subject name[English]	Advanced Sustainable Coordinator[Advanced Sustainable Coordinator]				
Schedule number	M44630190	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Fri.4～4	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	後藤　尚弘 GOTOH Naohiro				
Numbering					

Objectives of class

Goto

To establish a "Sustainable Society" is one of major fields for sustainable development. Countermeasures for it should be comprehensive and they comprise not only engineering but also several disciplines. The objectives of this class are

1 to comprehend notion of "Sustainable Society"

2 to learn human dimensional disciplines for "Sustainable Society"

3 to know planning method to establish "Sustainable Society" though examples

Tokairin

The objectives of this class are

1 to know air pollution situation

2 to understand the evaluation method of pollutant concentration

3 to understand the characteristics of planetary boundary layer

Goto

To establish a "Sustainable Society" is one of major fields for sustainable development. Countermeasures for it should be comprehensive and they comprise not only engineering but also several disciplines. The objectives of this class are

1 to comprehend notion of "Sustainable Society"

2 to learn human dimensional disciplines for "Sustainable Society"

3 to know planning method to establish "Sustainable Society" though examples

Tokairin

The objectives of this class are

1 to know air pollution situation

2 to understand the evaluation method of pollutant concentration

3 to understand the characteristics of planetary boundary layer

Contents of class

Goto

1 Concept of Sustainable development

2 Material (Substance) flow analysis and Life Cycle Assessment

3 Japanese environmental law and institution

Tokairin

1 Atmospheric environment and air pollution

2 Atmospheric diffusion modeling

3 Meteorology of planetary boundary layer

Goto

1 Concept of Sustainable development

2 Material (Substance) flow analysis and Life Cycle Assessment

3 Japanese environmental law and institution

Tokairin

1 Atmospheric environment and air pollution

2 Atmospheric diffusion modeling
3 Meteorology of planetary boundary layer

Self Preparation and Review

Related subjects

Notes for textbook
Goto
I will distribute copies of textbook in the first day.
・World resource institute, Weight of Nations
http://pubs.wri.org/pubs_description.cfm?PubID=3023
・NIES, Material Flow Data Book ~World Resource Flows around Japan~
http://www-cger.nies.go.jp/publication/D033/cd/index.html

Tokairin
I will distribute copies of document.

Goto
I will distribute copies of textbook in the first day.
・World resource institute, Weight of Nations
http://pubs.wri.org/pubs_description.cfm?PubID=3023
・NIES, Material Flow Data Book ~World Resource Flows around Japan~
http://www-cger.nies.go.jp/publication/D033/cd/index.html

Tokairin
I will distribute copies of document.

Notes for reference

Goals to be achieved
Goto
to understant how to establish sustainable society

Tokairin
to understand basics on atmospheric environment and its evaluation method.

Goto
to understant how to establish sustainable society

Tokairin
to understand basics on atmospheric environment and its evaluation method.

Evaluation of achievement
Every week and Term end report (100%)

Every week and Term end report (100%)

Examination
レポートで実施
By Report

Details of examination

Other information
Naohiro Goto (G603) goto@ens.tut.ac.jp
Takayuki Tokairin (G405) tokairin@ens.tut.ac.jp

Naohiro Goto (G603) goto@ens.tut.ac.jp
Takayuki Tokairin (G405) tokairin@ens.tut.ac.jp

Reference URL

Office hours

Any time by E-mail

Any time by E-mail

Relations to attainment objectives of learning and education

Key words

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

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

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

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

Objectives of class

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

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

Contents of class

1st Summary
2nd History
3rd Physical property 1
4th Physical property 2
5th Instrumentation and process engineering
6th Application of Supercritical Water Technologies 1
7th Application of Supercritical Water Technologies 2
8th Application of Supercritical Water Technologies 3
9th Application of Supercritical Water Technologies 4
10th Application of Supercritical Water Technologies 5
11th Application of Supercritical Carbon dioxide Technologies 1
12th Application of Supercritical Carbon dioxide Technologies 2
13th Application of Supercritical Carbon dioxide Technologies 3
14th Application of Supercritical Carbon dioxide Technologies 4
15th Examination

1st Summary
2nd History
3rd Physical property 1
4th Physical property 2
5th Instrumentation and process engineering
6th Application of Supercritical Water Technologies 1
7th Application of Supercritical Water Technologies 2
8th Application of Supercritical Water Technologies 3
9th Application of Supercritical Water Technologies 4
10th Application of Supercritical Water Technologies 5
11th Application of Supercritical Carbon dioxide Technologies 1
12th Application of Supercritical Carbon dioxide Technologies 2
13th Application of Supercritical Carbon dioxide Technologies 3
14th Application of Supercritical Carbon dioxide Technologies 4
15th Examination

Self Preparation and Review

Related subjects

Advanced Analytical Separation Chemistry, Advanced Industrial Ecology

Advanced Analytical Separation Chemistry, Advanced Industrial Ecology

Notes for textbook

1. Analytical Supercritical Fluid Chromatography and Extraction
edited by M. L. Lee and K. E. Markides, 1990

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

Notes for reference

Goals to be achieved

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

Evaluation of achievement

Based on Presentation and Interview during class
More than
80% ; A
65% ; B
55% ; C
Based on Presentation and Interview during class
More than
80% ; A
65% ; B
55% ; C

Examination

レポートで実施
By Report

Details of examination

Other information

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

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

Reference URL

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

Office hours

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

Relations to attainment objectives of learning and education

(D)

(D)

Key words

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

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

Subject name[English]	Advanced Life Science and Biotechnology II[Advanced Life Science and Biotechnology II]				
Schedule number	M44630220	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Intensive	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering					

Objectives of class

This course will provide the students with the opportunity to study on the selected subject in the realm of further advanced life science and biotechnology based on the knowledge of the course of Advanced Life Science and Biotechnology I.

This course will provide the students with the opportunity to study on the selected subject in the realm of further advanced life science and biotechnology based on the knowledge of the course of Advanced Life Science and Biotechnology I.

Contents of class

The classes will be given by his/her supervisor. The type and contents of this course depend on his/her supervisor.

The classes will be given by his/her supervisor. The type and contents of this course depend on his/her supervisor.

Self Preparation and Review

Related subjects

Advanced Life Science and Biotechnology I

Advanced Life Science and Biotechnology I

Notes for textbook

Notes for reference

Goals to be achieved

Evaluation of achievement

The evaluation is based on the scores of reports, presentations, and examination.

The evaluation is based on the scores of reports, presentations, and examination.

Examination

Details of examination

Other information

Supervisor

Supervisor

Reference URL

Office hours

Students are encouraged visiting by appointment.

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

Molecular biology and microbiology, genomics, biotechnology and bioengineering

Molecular biology and microbiology, genomics, biotechnology and bioengineering

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

Subject name[English]	Advanced Environmental Technology II[Advanced Environmental Technology II]				
Schedule number	M44630240	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Intensive	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering					

Objectives of class

This course will provide the students with the opportunity to study on the selected subject in the realm of further advanced environmental technology based on the knowledge of the course of Advanced Environmental Technology I.

This course will provide the students with the opportunity to study on the selected subject in the realm of further advanced environmental technology based on the knowledge of the course of Advanced Environmental Technology I.

Contents of class

The classes will be given by his/her supervisor. The type and contents of this course depend on his/her supervisor.

The classes will be given by his/her supervisor. The type and contents of this course depend on his/her supervisor.

Self Preparation and Review

Related subjects

Advanced Environmental Technology I

Advanced Environmental Technology I

Notes for textbook

Notes for reference

Goals to be achieved

Evaluation of achievement

The evaluation is based on the scores of reports, presentations, and examination.

The evaluation is based on the scores of reports, presentations, and examination.

Examination

Details of examination

Other information

Supervisor

Supervisor

Reference URL

Office hours

Students are encouraged visiting by appointment.

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Advanced Environmental and Ecological Systems II[Advanced Environmental and Ecological Systems II]				
Schedule number	M44630260	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Intensive	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering					

Objectives of class

This course will provide the students with the opportunity to study on the selected subject in the realm of further advanced environmental and ecological systems based on the knowledge of the course of Advanced Environmental and Ecological Systems I.

This course will provide the students with the opportunity to study on the selected subject in the realm of further advanced environmental and ecological systems based on the knowledge of the course of Advanced Environmental and Ecological Systems I.

Contents of class

The classes will be given by his/her supervisor. The type and contents of this course depend on his/her supervisor.

The classes will be given by his/her supervisor. The type and contents of this course depend on his/her supervisor.

Self Preparation and Review

Related subjects

Advanced Environmental and Ecological Systems I

Advanced Environmental and Ecological Systems I

Notes for textbook

Notes for reference

Goals to be achieved

Evaluation of achievement

The evaluation is based on the scores of reports, presentations, and examination.

The evaluation is based on the scores of reports, presentations, and examination.

Examination

Details of examination

Other information

Supervisor

Supervisor

Reference URL

Office hours

Students are encouraged visiting by appointment.

Students are encouraged visiting by appointment.

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	X-ray Spectroscopy for Catalytic Engineering[X-ray Spectroscopy for Catalytic Engineering]				
Schedule number	M44630280	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Spring2 term	**Day of the week,period**	Mon.3～3	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Environmental and Life Sciences			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	水嶋 生智 MIZUSHIMA Takanori				
Numbering					

Objectives of class

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

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

Contents of class

(1) Fundamentals of X-ray and its spectroscopy
(2) Principle, measurement techniques, and application of X-ray diffraction
(3) Principle and analysis of XAFS
(4) Measurement of XAFS using synchrotron radiation
(5) Measurement of XAFS by laboratory system
(6) Application of XAFS to catalyst characterization
(7) Advanced XAFS techniques and their applications
(8) Principle, measurement techniques, and application of fluorescent X-ray spectroscopy

(1) Fundamentals of X-ray and its spectroscopy
(2) Principle, measurement techniques, and application of X-ray diffraction
(3) Principle and analysis of XAFS
(4) Measurement of XAFS using synchrotron radiation
(5) Measurement of XAFS by laboratory system
(6) Application of XAFS to catalyst characterization
(7) Advanced XAFS techniques and their applications
(8) Principle, measurement techniques, and application of fluorescent X-ray spectroscopy

Self Preparation and Review

Related subjects

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

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

Notes for textbook

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

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

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

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

Notes for reference

Goals to be achieved

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

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

Evaluation of achievement
Reports 100%
Reports 100%

Examination

Details of examination

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

Reference URL

Office hours
Anytime
Anytime

Relations to attainment objectives of learning and education

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

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

Subject name[English]	Seminar on Architecture and Civil Engineering I[Seminar on Architecture and Civil Engineering I]				
Schedule number	M45610010	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	3
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Architecture and Civil Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering					

Objectives of class

All the students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.

All the students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.

Contents of class

In each seminar, students pursue several research topics and/or undertake projects collectively and solely under the instruction of the faculty members of the department and/or those of other departments.

In each seminar, students pursue several research topics and/or undertake projects collectively and solely under the instruction of the faculty members of the department and/or those of other departments.

Self Preparation and Review

Related subjects

Notes for textbook

Notes for reference

Goals to be achieved

Evaluation of achievement

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Seminar on Architecture and Civil Engineering II[Seminar on Architecture and Civil Engineering II]				
Schedule number	M45610020	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	3
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Architecture and Civil Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering					

Objectives of class

All the students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.

All the students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.

Contents of class

In each seminar, students pursue several research topics and/or undertake projects collectively and solely under the instruction of the faculty members of the department and/or those of other departments.

In each seminar, students pursue several research topics and/or undertake projects collectively and solely under the instruction of the faculty members of the department and/or those of other departments.

Self Preparation and Review

Related subjects

Notes for textbook

Notes for reference

Goals to be achieved

Evaluation of achievement

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(M45610030)Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]

Subject name[English]	Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]				
Schedule number	M45610030	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Required
Time of starting a course	2Years	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S5系教務委員, 各教員 5kei kyomu Iin-S, KAKUKYOUIN Kakukyouin				
Numbering					

Objectives of class

Research on architecture and civil engineering

Research on architecture and civil engineering

Contents of class

It depends on the laboratory. All students must present their thesis at the end of the course and take a final examination on the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor.

It depends on the laboratory. All students must present their thesis at the end of the course and take a final examination on the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor.

Self Preparation and Review

Related subjects

It depends on the laboratory

It depends on the laboratory

Notes for textbook

It depends on the laboratory

It depends on the laboratory

Notes for reference

Goals to be achieved

Evaluation of achievement

This credit is assigned for all the process for the preparation and presentation of the thesis.

This credit is assigned for all the process for the preparation and presentation of the thesis.

Examination

Details of examination

Other information

It depends on the laboratory.

It depends on the laboratory.

Reference URL

It depends on the laboratory.

It depends on the laboratory.

Office hours

It depends on the laboratory

It depends on the laboratory

Relations to attainment objectives of learning and education

Key words

(M45610030)Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]

Subject name[English]	Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]				
Schedule number	M45610030	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Required
Time of starting a course	2Years	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Architecture and Civil Engineering			**Beggining grade**	M1, M2
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering					

Objectives of class

This thesis research on architecture and civil engineering is designated to deepen the knowledge and enhance the skills of the students in their research fields through the self-oriented endeavour with the instruction of his/her supervisor(s).

This thesis research on architecture and civil engineering is designated to deepen the knowledge and enhance the skills of the students in their research fields through the self-oriented endeavour with the instruction of his/her supervisor(s).

Contents of class

The subjects and the contents of the thesis vary depending on the laboratory. All students must present their thesis at the end of the course and take a final examination on the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor(s).

The subjects and the contents of the thesis vary depending on the laboratory. All students must present their thesis at the end of the course and take a final examination on the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor(s).

Self Preparation and Review

Related subjects

TBD by the laboratory

TBD by the laboratory

Notes for textbook

TBD by the laboratory

TBD by the laboratory

Notes for reference

Goals to be achieved

Evaluation of achievement

This credit is assigned for all the process for the preparation and presentation of the thesis.

This credit is assigned for all the process for the preparation and presentation of the thesis.

Examination

Details of examination

Other information

Refer to administration office.

Refer to administration office.

Reference URL

Refer to the URL of each laboratory

Refer to the URL of each laboratory

Office hours

Refer to administration office.

Refer to administration office.

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]				
Schedule number	M4561003T	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Architecture and Civil Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering					

Objectives of class

This thesis research on architecture and civil engineering is designated to deepen the knowledge and enhance the skills of the students in their research fields through the self-oriented endeavour with the instruction of his/her supervisor(s).

This thesis research on architecture and civil engineering is designated to deepen the knowledge and enhance the skills of the students in their research fields through the self-oriented endeavour with the instruction of his/her supervisor(s).

Contents of class

The subjects and the contents of the thesis vary depending on the laboratory. All students must present their thesis at the end of the course and take a final examination on the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor(s).

The subjects and the contents of the thesis vary depending on the laboratory. All students must present their thesis at the end of the course and take a final examination on the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor(s).

Self Preparation and Review

Related subjects

TBD by the laboratory

TBD by the laboratory

Notes for textbook

TBD by the laboratory

TBD by the laboratory

Notes for reference

Goals to be achieved

Evaluation of achievement

This credit is assigned for all the process for the preparation and presentation of the thesis.

This credit is assigned for all the process for the preparation and presentation of the thesis.

Examination

Details of examination

Other information

Refer to administration office.

Refer to administration office.

Reference URL

Refer to the URL of each laboratory

Refer to the URL of each laboratory

Office hours

Refer to administration office.

Refer to administration office.

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Seminar on Architecture and Civil Engineering[Seminar on Architecture and Civil Engineering]				
Schedule number	M45610040	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Architecture and Civil Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering					

Objectives of class

All the students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.

All the students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.

Contents of class

In each seminar, students pursue several research topics and/or undertake projects collectively and solely under the instruction of the faculty members of the department and/or those of other departments.

In each seminar, students pursue several research topics and/or undertake projects collectively and solely under the instruction of the faculty members of the department and/or those of other departments.

Self Preparation and Review

Related subjects

Notes for textbook

Notes for reference

Goals to be achieved

Evaluation of achievement

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(M45630040)Geologic Hazard and Mitigation Planning[Geologic Hazard and Mitigation Planning]

Subject name[English]	Geologic Hazard and Mitigation Planning[Geologic Hazard and Mitigation Planning]				
Schedule number	M45630040	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Mon.3～3	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Architecture and Civil Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	河邑 眞 KAWAMURA Makoto				
Numbering					

Objectives of class

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

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

Contents of class

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

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

Self Preparation and Review

Related subjects

geology,urban planning,risk management

geology,urban planning,risk management

Notes for textbook

Referrence:
Griggs and Gilchrist:Geologic hazards,resources,and environmental planning,
Wadsworth Publishing Company,1983.

Referrence:
Griggs and Gilchrist:Geologic hazards,resources,and environmental planning,
Wadsworth Publishing Company,1983.

Notes for reference

Goals to be achieved

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

Evaluation of achievement

Report and the presentation of the report.
Report and the presentation of the report.

Examination

Details of examination

Other information

office:D-806
Tel:0532-44-6847
E-mail:kawamura@tutrp.tut.ac.jp
office:D-806
Tel:0532-44-6847
E-mail:kawamura@tutrp.tut.ac.jp

Reference URL

preparing
preparing

Office hours

13:00-15:00 Tuesday
13:00-15:00 Tuesday

Relations to attainment objectives of learning and education

graduate course subject is not related with JABEE

graduate course subject is not related with JABEE

Key words

geologic hazard,　mitigation planning
geologic hazard,　mitigation planning

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

Objectives of class

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

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

Contents of class

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. General Introduction to indoor air environment
2. Building related illness and indoor air quality
3. Physical/chemical characteristics of air quality
4. Measurement techniques of air pollutants
5. Modeling of material emission and sorption
6. Prediction method for indoor air quality (IAQ) in rooms
7. CFD analysis of air movement
8. Performance evaluation of ventilation systems
9. Ventilation system design for pollutant control
10. Guidelines, codes and standard
11. Research and Development on IAQ (1)
12. Research and Development on IAQ (2)
13. Research and Development on IAQ (3)
14. Discussion on IAQ related issues
15. Supplementary lecture

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. General Introduction to indoor air environment
2. Building related illness and indoor air quality
3. Physical/chemical characteristics of air quality
4. Measurement techniques of air pollutants
5. Modeling of material emission and sorption
6. Prediction method for indoor air quality (IAQ) in rooms
7. CFD analysis of air movement
8. Performance evaluation of ventilation systems
9. Ventilation system design for pollutant control
10. Guidelines, codes and standard
11. Research and Development on IAQ (1)
12. Research and Development on IAQ (2)
13. Research and Development on IAQ (3)
14. Discussion on IAQ related issues
15. Supplementary lecture

Self Preparation and Review

Related subjects
Building Climate
Building Climate

Notes for textbook
The related handout will be distributed.
The related handout will be distributed.

Notes for reference

Goals to be achieved
Achievement level of this course is to understand the background of sick building syndrome and the practical strategies to realize a good air environment by controlling indoor air quality and ventilation in buildings, and also propose the healthy and sustainable buildings.
Achievement level of this course is to understand the background of sick building syndrome and the practical strategies to realize a good air environment by controlling indoor air quality and ventilation in buildings, and also propose the healthy and sustainable buildings.

Evaluation of achievement
Reports related to this subject are reviewed to evaluate the achievement level.
Reports related to this subject are reviewed to evaluate the achievement level.

Examination

Details of examination

Other information
Room: D-710, Phone:0532-44-6838, Fax: 0532-44-6831
E-mail: matsu@ace.tut.ac.jp
Room: D-710, Phone:0532-44-6838, Fax: 0532-44-6831
E-mail: matsu@ace.tut.ac.jp

Reference URL
http://einstein.ace.tut.ac.jp/
http://einstein.ace.tut.ac.jp/

Office hours
Thursday 13:00-14:30
Thursday 13:00-14:30

Relations to attainment objectives of learning and education

Key words
Indoor Air Quality, Healthy Building, Sick Building Syndrome, Ventilation
Indoor Air Quality, Healthy Building, Sick Building Syndrome, Ventilation

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

Subject name[English]	Human Settlement: Its History and Theory[Human Settlement: Its History and Theory]				
Schedule number	M45630120	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Thu.3～3	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Architecture and Civil Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	泉田 英雄 IZUMIDA Hideo				
Numbering					

Objectives of class

After introducing Japanese traditional architecture, its modern development is described in various points of view; foreign influence and introduction of western technology, architectural education, public works department, beautification by neo-classic style, modern movement, Ginza Reconstruction and Parliament Building projects, building enactments, response to natural disasters, etc.

After introducing Japanese traditional architecture, its modern development is described in various points of view; foreign influence and introduction of western technology, architectural education, public works department, beautification by neo-classic style, modern movement, Ginza Reconstruction and Parliament Building projects, building enactments, response to natural disasters, etc.

Contents of class

1. Introduction to Japanese architecture; technical and aesthetic points of view
2. Environment and Natural Resources
3. Early Town Planning and Joka-Machi
4. Buddhist and Shrine Architecture
5. City Excursion
6. Ancient House to Pre-Modern House through Shinden Style, Teahouse Style, Shoin Style
7. Response to Colonialism; naval school, lighthouse, foreign settlement, foreign engineers
8. Employed Foreign Architects and Engineering School; Boinville, Conder, Imperial College, etc.
9. First Generation of Japanese Architects and their roles
10. Earthquake and Architecture
11. City Excursion
12. Modern movement
13. Frank L. Wright and Japanese architects
14. Destruction during the IIWW and the reconstruction
15. Discussion

1. Introduction to Japanese architecture; technical and aesthetic points of view
2. Environment and Natural Resources
3. Early Town Planning and Joka-Machi
4. Buddhist and Shrine Architecture
5. City Excursion
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7. Response to Colonialism; naval school, lighthouse, foreign settlement, foreign engineers
8. Employed Foreign Architects and Engineering School; Boinville, Conder, Imperial College, etc.
9. First Generation of Japanese Architects and their roles
10. Earthquake and Architecture
11. City Excursion
12. Modern movement
13. Frank L. Wright and Japanese architects
14. Destruction during the IIWW and the reconstruction
15. Discussion

Self Preparation and Review

Related subjects

・Knowledge of History of Architecture and City
・Basic knowledge of Japanese history
・Knowledge of History of Architecture and City

・Basic knowledge of Japanese history

Notes for textbook

・K. Franpton and K. Kunio, Japanese Building Practice, CUP
・K. Franpton and K. Kunio, Japanese Building Practice, CUP

Notes for reference

Goals to be achieved

Evaluation of achievement

・Several reports should be submitted.
・Final Presentation
・Several reports should be submitted.
・Final Presentation

Examination

Details of examination

Other information

・Room D3-804, 6861
izumida@tutrp.tut.ac.jp
・Room D3-804, 6861
izumida@tutrp.tut.ac.jp

Reference URL

http://gamac.tutrp.tut.ac.jp/
http://gamac.tutrp.tut.ac.jp/

Office hours

13:30-15:00, Monday, 13:30-15:00, Wednesday. Other than these days, send me your email to take appointment.

13:30-15:00, Monday, 13:30-15:00, Wednesday. Other than these days, send me your email to take appointment.

Relations to attainment objectives of learning and education

Key words

Japanese architecture, modern architecture, urban development
Japanese architecture, modern architecture, urban development

(M45630140)Advanced District Planning[Advanced District Planning]

Subject name[English]	Advanced District Planning[Advanced District Planning]				
Schedule number	M45630140	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Tue.2～2	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Architecture and Civil Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	浅野　純一郎 ASANO Junichiro				
Numbering					

Objectives of class

1) To gain the practical knowledge of urban and district planning.
2) To learn the advanced methods of district planning and design.
3) To learn the theory and the system of Japanese land use control system and land readjustment projects.

1) To gain the practical knowledge of urban and district planning.
2) To learn the advanced methods of district planning and design.
3) To learn the theory and the system of Japanese land use control system and land readjustment projects.

Contents of class

The major topics that will be addressed in this class are the followings.
1. Overview of the theory and concrete policy and methods about modern urban planning system in Japanese
2. Overview of Japanese land use control system, especially area division system and development permission.
3. Overview of Japanese land readjustment projects.
4. Practice by application of the design methods about land readjustment project and district planning.
Reporting textbook "Urban Planning System in Japan 2nd Edition" and doing workshop about land readjustment project and district planning.

The major topics that will be addressed in this class are the followings.
1. Overview of the theory and concrete policy and methods about modern urban planning system in Japanese
2. Overview of Japanese land use control system, especially area division system and development permission.
3. Overview of Japanese land readjustment projects.
4. Practice by application of the design methods about land readjustment project and district planning.
Reporting textbook "Urban Planning System in Japan 2nd Edition" and doing workshop about land readjustment project and district planning.

Self Preparation and Review

Related subjects

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

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

Notes for textbook

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

・Urban Planning System in Japan 2nd Edition
・Urban Land Use Planning System in Japan 2dn Edition

Both have been published by Japan International Cooperation Agency

Notes for reference

Goals to be achieved

Evaluation of achievement

Submitting reports about textbook and another theme. Oral presentation: 30%, Written report: 70%

Submitting reports about textbook and another theme. Oral presentation: 30%, Written report: 70%

Examination

レポートで実施

By Report

Details of examination

Other information

Reference URL

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

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

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

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

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

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

Office hours

Relations to attainment objectives of learning and education

Key words

District planning, Land use control system, Land readjustment project

District planning, Land use control system, Land readjustment project

(M45630180)Advanced Computational Economics[Advanced Computational Economics]

Subject name[English]	Advanced Computational Economics[Advanced Computational Economics]				
Schedule number	M45630180	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Thu.1～1	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Architecture and Civil Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	渋澤 博幸 SHIBUSAWA Hiroyuki				
Numbering					

Objectives of class

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

Contents of class

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

Self Preparation and Review

Related subjects

Economics, Policy, Simulation
Economics, Policy, Simulation

Notes for textbook

Papers will be distributed.
Papers will be distributed.

Notes for reference

Goals to be achieved

Advanced Computational Economics
Advanced Economic Simulation Model

Advanced Computational Economics
Advanced Economic Simulation Model

Evaluation of achievement

Reports must be submitted.
A: 80 Points or higher, B: 65 points or higher, C:55 points or higher, D: Less than 55 points

Reports must be submitted.
A: 80 Points or higher, B: 65 points or higher, C:55 points or higher, D: Less than 55 points

Examination

レポートで実施

By Report

Details of examination

Other information

Room:B-409

Tel:6963

E-mail: hiro-shibu@tut.jp

Room:B-409

Tel:6963

E-mail: hiro-shibu@tut.jp

Reference URL

www.pm.ace.tut.ac.jp

www.pm.ace.tut.ac.jp

Office hours

Tuesday 9:00-10:00

Tuesday 9:00-10:00

Relations to attainment objectives of learning and education

Key words

Computational Economics, Simulation

Computational Economics, Simulation

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

Subject name[English]	Advanced Structural System Planning and Design II[Advanced Structural System Planning and Design II]				
Schedule number	M45630200	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Intensive	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Architecture and Civil Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering					

Objectives of class

It depends on the laboratory. The resistered students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.

It depends on the laboratory. The resistered students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.

Contents of class

Self Preparation and Review

Related subjects

Notes for textbook

Notes for reference

Goals to be achieved

Evaluation of achievement

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Advanced Environmental System Planning and Design II[Advanced Environmental System Planning and Design II]				
Schedule number	M45630220	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Intensive	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Architecture and Civil Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering					

Objectives of class

It depends on the laboratory. The resistered students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.

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Contents of class

Self Preparation and Review

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Goals to be achieved

Evaluation of achievement

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Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Advanced Regional System Planning and Design II[Advanced Regional System Planning and Design II]				
Schedule number	M45630240	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Intensive	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Architecture and Civil Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering					

Objectives of class

It depends on the laboratory. The resistered students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.

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Contents of class

Self Preparation and Review

Related subjects

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Goals to be achieved

Evaluation of achievement

Examination

Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Water Environment Engineering I[Water Environment Engineering I]				
Schedule number	M45630310	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Spring term	**Day of the week,period**	Tue.2～2	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered	Architecture and Civil Engineering			**Beggining grade**	
Charge teacher name[Roman alphabet mark]	横田　久里子 YOKOTA Kuriko				
Numbering					

Objectives of class

To know and understand the water pollutants in water environment.
To know and understand Environmental Quality Standards for Water Pollutants in Japan.
To know and understand the water pollutants in water environment.
To know and understand Environmental Quality Standards for Water Pollutants in Japan.

Contents of class

History of Water Pollution in Japan
1) Minamata disease
2) Chronic cadmium poisoning
Environmental Quality Standards for Water Pollutants
1)Environmental Quality Standards for Human Health and Monitored Substances and Guideline Values
2)Environmental Quality Standards for Conservation of the Living Environment

Water pollutants in water environment
1)Nutrients
2)Chemicals in water environment
History of Water Pollution in Japan
1) Minamata disease
2) Chronic cadmium poisoning
Environmental Quality Standards for Water Pollutants
1)Environmental Quality Standards for Human Health and Monitored Substances and Guideline Values
2)Environmental Quality Standards for Conservation of the Living Environment

Water pollutants in water environment
1)Nutrients
2)Chemicals in water environment

Self Preparation and Review

Related subjects

Notes for textbook

No textbook is required for this class.
No textbook is required for this class.

Notes for reference

Goals to be achieved

To understand the water pollution and environmental quality standard.
To understand the water pollution and environmental quality standard.

Evaluation of achievement

Reports
Reports

Examination

Details of examination

Other information

D-810
Tel:6851
e-mail:yokota@ace.tut.ac.jp
D-810
Tel:6851
e-mail:yokota@ace.tut.ac.jp

Reference URL

Office hours

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

Relations to attainment objectives of learning and education

Key words