Syllabus

International Master′s Degree Program

（2013-Fall Term）

(M40030020)Industrial Policies[Industrial Policies]

Subject name[English]	Industrial Policies[Industrial Policies]				
Schedule number	M40030020	**Subject area**	General courses	**Required or elective**	Elective
Time of starting a course	Fall term	**Day of the week,period**	Wed.4～4	**Credit(s)**	2
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	渋澤 博幸 SHIBUSAWA Hiroyuki				
Numbering					

Objectives of class

In this course, students learn the fundamental of input-output analysis and the industrial policy evaluation methodology.
In this course, students learn the fundamental of input-output analysis and the industrial policy evaluation methodology.

Contents of class

1: Introduction and Overview
2-6:Input-Output Analysis at the National Level
7-8: Numerical Examples and Case Studies at the National Level
9-13:Input-Output Analysis at the Regional Level
14-15: Numerical Examples and Case Studies at the Regional Level

1: Introduction and Overview
2-6:Input-Output Analysis at the National Level
7-8: Numerical Examples and Case Studies at the National Level
9-13:Input-Output Analysis at the Regional Level
14-15: Numerical Examples and Case Studies at the Regional Level

Self Preparation and Review

Related subjects

Economics, Policy, Simulation
Economics, Policy, Simulation

Notes for textbook

Papers will be distributed.

Reference：Miller and Blair, Input-Output Analysis(Second Edition), Cambridge University Press, 2009

Papers will be distributed.

Reference：Miller and Blair, Input-Output Analysis(Second Edition), Cambridge University Press, 2009

Notes for reference

Goals to be achieved

Advanced Input-Output Analysis
Advanced Economic Simulation Methods

Advanced Input-Output Analysis
Advanced Economic Simulation Methods

Evaluation of achievement

Test(50%)+Report(50%)=100%
A: 80 Points or higher, B:65 points or higher, C:55 points or higher, D: Less than 55 points
Test(50%)+Report(50%)=100%
A: 80 Points or higher, B:65 points or higher, C:55 points or higher, D: Less than 55 points

Examination

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 10:00-12:00
Tuesday 10:00-12:00

Relations to attainment objectives of learning and education

Key words

Industrial Policy, Economics, Simulation
Industrial Policy, Economics, Simulation

(M40030040)Culture and Communication II[Culture and Communication II]

Subject name[English]	Culture and Communication II[Culture and Communication II]				
Schedule number	M40030040	**Subject area**	General courses	**Required or elective**	Elective
Time of starting a course	Fall 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	笹尾　洋介 SASAO Yosuke				
Numbering					

Objectives of class

This course looks at the role of vocabulary knowledge in second language learning.
This course looks at the role of vocabulary knowledge in second language learning.

Contents of class

Students will choose a specific topic to research from the topics below and give an oral presentation about it. They will also discuss some important issues relating to the topic.

Students are required to attend the class on Week 1 because the date and the topic for the oral presentation will be determined there.

Week 1 (October 4): Course introduction
Week 2 (October 18): The goals of vocabulary learning
Week 3 (October 25): Knowing a word
Week 4 (November 1): Teaching and explaining vocabulary
Week 5 (November 8): Vocabulary and listening and speaking
Week 6 (November 15): Vocabulary and reading
Week 7 (November 22): Vocabulary and writing
Week 8 (December 6): Specialised uses of vocabulary
Week 9 (December 13): Vocabulary learning strategies
Week 10 (January 10): Guessing from context
Week 11 (January 24): Word study strategies: word parts and dictionary use
Week 12 (January 31): Word study strategies: word cards
Week 13 (February 7): Chunking and collocation
Week 14 (February 14): Testing vocabulary knowledge and use
Week 15 (February 21): Review

Students will choose a specific topic to research from the topics below and give an oral presentation about it. They will also discuss some important issues relating to the topic.

Students are required to attend the class on Week 1 because the date and the topic for the oral presentation will be determined there.

Week 1 (October 4): Course introduction
Week 2 (October 18): The goals of vocabulary learning
Week 3 (October 25): Knowing a word
Week 4 (November 1): Teaching and explaining vocabulary
Week 5 (November 8): Vocabulary and listening and speaking
Week 6 (November 15): Vocabulary and reading
Week 7 (November 22): Vocabulary and writing
Week 8 (December 6): Specialised uses of vocabulary
Week 9 (December 13): Vocabulary learning strategies
Week 10 (January 10): Guessing from context
Week 11 (January 24): Word study strategies: word parts and dictionary use
Week 12 (January 31): Word study strategies: word cards
Week 13 (February 7): Chunking and collocation
Week 14 (February 14): Testing vocabulary knowledge and use
Week 15 (February 21): Review

Self Preparation and Review

Related subjects
Notes for textbook All materials for this class will be provided. All materials for this class will be provided.
Notes for reference
Goals to be achieved Understanding key issues in second language vocabulary learning Understanding key issues in second language vocabulary learning
Evaluation of achievement Oral presentation (20%), classwork (40%), term paper (40%) Oral presentation (20%), classwork (40%), term paper (40%)
Examination
Details of examination
Other information Office：B-516-3 Ext：6961 E-mail: ysasao@las.tut.ac.jp Office：B-516-3 Ext：6961 E-mail: ysasao@las.tut.ac.jp
Reference URL
Office hours Mon 13：00－14：00 Tue 13：00—14：00 Mon 13：00－14：00 Tue 13：00—14：00
Relations to attainment objectives of learning and education
Key words vocabulary learning, second language acquisition vocabulary learning, second language acquisition

(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.

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

(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.

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.

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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

(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.

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

Self Preparation and Review

Related subjects

Notes for textbook

Reference and material will be available from the supervisor.

Reference and material will be available from the supervisor.

Notes for reference

Goals to be achieved

To get something new on individual research fields.
To develop your research skills including planning and presentation skills.

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.

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

Contents of class

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

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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 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

(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

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

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

Contents of class

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

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

Self Preparation and Review

Related subjects

Notes for textbook

Reference and material will be available from the supervisor.

Reference and material will be available from the supervisor.

Notes for reference

Goals to be achieved

To get something new on individual research fields.
To develop your research skills including planning and presentation skills.

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

(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				
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.

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Self Preparation and Review

Related subjects

Notes for textbook

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Notes for reference

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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

(M41630040)Micromachining Engineering[Micromachining Engineering]

Subject name[English]	Micromachining Engineering[Micromachining Engineering]				
Schedule number	M41630040	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Fall2 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	柴田　隆行 SHIBATA Takayuki				
Numbering					

Objectives of class

Fundamentals of micromachining technologies for the development of "Micro Electro Mechanical System (MEMS)" and "Micro Total Analysis System (μ TAS)".

Fundamentals of micromachining technologies for the development of "Micro Electro Mechanical System (MEMS)" and "Micro Total Analysis System (μ TAS)".

Contents of class

1. Introduction of MEMS and μ TAS
2. Photolithography
3. Wet etching and Dry etching
4. Physical vapor deposition (PVD) and Chemical vapor deposition (CVD)
5. Plating and Electroforming
6. Bonding processes
7. Surface micromachining and Bulk micromachining

Students are required to prepare and review each lesson.

1. Introduction of MEMS and μ TAS
2. Photolithography
3. Wet etching and Dry etching
4. Physical vapor deposition (PVD) and Chemical vapor deposition (CVD)
5. Plating and Electroforming
6. Bonding processes
7. Surface micromachining and Bulk micromachining

Students are required to prepare and review each lesson.

Self Preparation and Review

Related subjects

A fundamental knowledge of physics and chemistry is required.

A fundamental knowledge of physics and chemistry is required.

Notes for textbook

No textbook is required for this class.

Useful information on MEMS technologies can be obtained fromthe following website; http://www.memsnet.org/mems/

(Reference)

M.J. Madou, "Fundamentals of Microfabrication, 2nd ed.", CRC Press, 2002.
S.Franssila, "Introduction to Microfabrication", John Wiley & Sons, 2004.
M. Gad-El-Hak, "The Mems Handbook, 2nd ed.", CRC Pr I Llc, 2006.
G.T.A. Kovacs, "Micromachined Transducers Sourcebook", McGraw-Hill, 1998.

No textbook is required for this class.
Useful information on MEMS technologies can be obtained fromthe following website; http://www.memsnet.org/mems/

(Reference)
M.J. Madou, "Fundamentals of Microfabrication, 2nd ed.", CRC Press, 2002.
S.Franssila, "Introduction to Microfabrication", John Wiley & Sons, 2004.
M. Gad-El-Hak, "The Mems Handbook, 2nd ed.", CRC Pr I Llc, 2006.
G.T.A. Kovacs, "Micromachined Transducers Sourcebook", McGraw-Hill, 1998.

Notes for reference

Goals to be achieved

- To gain an understanding of the fundamentals of micromachining technologies for MEMS and μTAS
- To apply knowledge of micromachining technologies to the design and manufacturing of microdevices

- To gain an understanding of the fundamentals of micromachining technologies for MEMS and μTAS
- To apply knowledge of micromachining technologies to the design and manufacturing of microdevices

Evaluation of achievement

Presentation (70%) and classroom performance (30%). An oral presentation on micromachining technologies for the fabrication of MEMS and/or μTAS devices will be imposed during the course of class.

Presentation (70%) and classroom performance (30%). An oral presentation on micromachining technologies for the fabrication of MEMS and/or μTAS devices will be imposed during the course of class.

Examination

Details of examination

Other information

Takayuki Shibata: room D-605, E-mail: shibata@me.tut.ac.jp

Takayuki Shibata: room D-605, E-mail: shibata@me.tut.ac.jp

Reference URL

Office hours

Anytime during regular working hours. Contact me by email before coming if possible.

Anytime during regular working hours. Contact me by email before coming if possible.

Relations to attainment objectives of learning and education

Key words

Micromachining, Microfabrication, Photolithography, Wet etching, Dry etching, Physical vapor deposition (PVD), Chemical vapor deposition (CVD), MEMS, μTAS

Micromachining, Microfabrication, Photolithography, Wet etching, Dry etching, Physical vapor deposition (PVD), Chemical vapor deposition (CVD), MEMS, μTAS

(M41630050)Biomechanics of Human Locomotion[Biomechanics of Human Locomotion]

Subject name[English]	Biomechanics of Human Locomotion[Biomechanics of Human Locomotion]				
Schedule number	M41630050	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Fall1 term	**Day of the week,period**	Thu.5～5	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	安田　好文 YASUDA Yoshifumi				
Numbering					

Objectives of class

Biomechnics of human locomotion can be defined as describing, analysing and assessing of human movements by means of the methods of mechanics. This lecture aims to facilitate the understanding on the fundamental mechanics of human locomotion such as walking, running, and cycling based on the structure and function of muscle, skelton and nervous systems.

Biomechnics of human locomotion can be defined as describing, analysing and assessing of human movements by means of the methods of mechanics. This lecture aims to facilitate the understanding on the fundamental mechanics of human locomotion such as walking, running, and cycling based on the structure and function of muscle, skelton and nervous systems.

Contents of class

1. Research objectives and methodologies in the study of biomechanics.
2. Fundamentals of skelton, joint, and ligament systems in the human body.
3. The structure and function of skeletal muscle.
4. Motor control and sensory informatics for human locomotion.
5. Kinematic analyses of human movements.
6. Kinetic analyses of human movements.
7. Electromyography: basic principle and its applications.

1. Research objectives and methodologies in the study of biomechanics.
2. Fundamentals of skelton, joint, and ligament systems in the human body.
3. The structure and function of skeletal muscle.
4. Motor control and sensory informatics for human locomotion.
5. Kinematic analyses of human movements.
6. Kinetic analyses of human movements.
7. Electromyography: basic principle and its applications.

Self Preparation and Review

Related subjects

1. Advanced Exercise Physiology, given by Y. Yasuda in the spring term.

1. Advanced Exercise Physiology, given by Y. Yasuda in the spring term.

Notes for textbook

Handouts will be prepared.
The following book is also referred to;
"Winter D.A.: Biomechanics and Motor Control of Human Movement, Published by John Wiley & Sons, Inc., in 2009"

Handouts will be prepared.
The following book is also referred to;
"Winter D.A.: Biomechanics and Motor Control of Human Movement, Published by John Wiley & Sons, Inc., in 2009"

Notes for reference

Goals to be achieved

1. To understand the use of mechanical principle and methodologies to human movements.
2. To understand the structure and function of muscle, joint and nervous systems in human locomotion.

1. To understand the use of mechanical principle and methodologies to human movements.
2. To understand the structure and function of muscle, joint and nervous systems in human locomotion.

Evaluation of achievement

The summation of the final report (50%) and short reports regarding the topics covered in the lecture (50%).

The summation of the final report (50%) and short reports regarding the topics covered in the lecture (50%).

Examination

Details of examination

Other information

Room: The 2nd floor in the Research Center for Physical Fitness, Sports and Health.
Tel: 0532-44-6631, E-mail: yasuda@las.tut.ac.jp

Room: The 2nd floor in the Research Center for Physical Fitness, Sports and Health.
Tel: 0532-44-6631, E-mail: yasuda@las.tut.ac.jp

Reference URL

http//.www.health.tut.ac.jp

http//.www.health.tut.ac.jp

Office hours

Monday afternoon (PM3:00-5:00)

Monday afternoon (PM3:00-5:00)

Relations to attainment objectives of learning and education

Key words

kinetic, kinematic, locomotion, mechanical efficiency, energy, power, torque

kinetic, kinematic, locomotion, mechanical efficiency, energy, power, torque

(M41630110)Engineering Safety[Engineering Safety]

Subject name[English]	Engineering Safety[Engineering Safety]				
Schedule number	M41630110	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Fall1 term	**Day of the week,period**	Thu.1～1	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	BATRES PRIETO RAFAELBATRES PRIETO RAFAEL				
Numbering					

Objectives of class

In this course students will learn qualitative and quantitative methods for analyzing the safety of engineered artifacts. The course is based on engineering and science fundamentals such as thermodynamics and statistics to analyze potential hazards, risk, reliability, fault logic, and failure modes. This course is also intended to provide a background in managing an overall safety program and its application to industries such as manufacturing, oil and chemical, pharmaceuticals, defense, aerospace, paper, and information technology.

In this course students will learn qualitative and quantitative methods for analyzing the safety of engineered artifacts. The course is based on engineering and science fundamentals such as thermodynamics and statistics to analyze potential hazards, risk, reliability, fault logic, and failure modes. This course is also intended to provide a background in managing an overall safety program and its application to industries such as manufacturing, oil and chemical, pharmaceuticals, defense, aerospace, paper, and information technology.

Contents of class

1. Introduction to system safety (week 1)
2. Hazards Scenarios (week 2)
3. Hazards and Operability Studies (week 3)
4. Hazards and Operability Studies (week 4)
5. Case study (week 5)
6. Probabilistic Risk Assessment (week 6)
7. Risk Management (week 7)

1. Introduction to system safety (week 1)
2. Hazards Scenarios (week 2)
3. Hazards and Operability Studies (week 3)
4. Hazards and Operability Studies (week 4)
5. Case study (week 5)
6. Probabilistic Risk Assessment (week 6)
7. Risk Management (week 7)

Self Preparation and Review

Related subjects

Engineering fundamentals, Statistics

Engineering fundamentals, Statistics

Notes for textbook

* Clemens, P. L. and R. J. Simmons. System Safety and Risk Management – A Guide for Engineering Educators. (1998). [Available from the Course Web Page]
* Lee's Loss prevention in the process industries: hazard identification, assessment and control.3rd ed. / [edited by] Sam Mannan (2005)

* Clemens, P. L. and R. J. Simmons. System Safety and Risk Management – A Guide for Engineering Educators. (1998). [Available from the Course Web Page]
* Lee's Loss prevention in the process industries: hazard identification, assessment and control.3rd ed. / [edited by] Sam Mannan (2005)

Notes for reference

Goals to be achieved

Student will be able to:
1. Identify and describe a hazard scenario
2. Generate deviations from a given design intent

3. Identify causes of the deviations
3. Identify consequences and their resulting hazards
4. Find and document existing safeguards
5. Propose corrective and preventive actions
6. Determine the amount of risk based on reliability data
7. Describe the risk management process
8. Enumerate the key aspects of social responsibility
Student will be able to:
1. Identify and describe a hazard scenario
2. Generate deviations from a given design intent
3. Identify causes of the deviations
3. Identify consequences and their resulting hazards
4. Find and document existing safeguards
5. Propose corrective and preventive actions
6. Determine the amount of risk based on reliability data
7. Describe the risk management process
8. Enumerate the key aspects of social responsibility

Evaluation of achievement

A case study will be assigned in which students will analyze a specific process or artifact using the methods introduced during the course. A final report will be due the last day of the course.
A case study will be assigned in which students will analyze a specific process or artifact using the methods introduced during the course. A final report will be due the last day of the course.

Examination

Details of examination

Other information

Room: D611, Ext: 6716, e-mail: rbp@tut.jp
Room: D611, Ext: 6716, e-mail: rbp@tut.jp

Reference URL

http://ise.me.tut.ac.jp/lectures/safety/
http://ise.me.tut.ac.jp/lectures/safety/

Office hours

I will be available immediately following class. Other office hours by appointment (via email).
I will be available immediately following class. Other office hours by appointment (via email).

Relations to attainment objectives of learning and education

Key words

safety, risk analysis, reliability, social responsibility, ethics in engineering
safety, risk analysis, reliability, social responsibility, ethics in engineering

(M41630120)Time-frequency Analysis and Wavelet Transform[Time-frequency Analysis and Wavelet Transform]

Subject name[English]	Time-frequency Analysis and Wavelet Transform[Time-frequency Analysis and Wavelet Transform]				
Schedule number	M41630120	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Fall2 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	章 忠 SHO Tadashi				
Numbering					

Objectives of class

To obtain advanced knowledge of time-frequency analysis and image processing by utilizing wavelet transform.
To obtain advanced knowledge of time-frequency analysis and image processing by utilizing wavelet transform.

Contents of class

1. Basic theory of time-frequency analysis method will be briefly discussed.
1)Shot-Time Fourier transform
2)The Wigner-Ville Distribution
3)Hilbert Transform and instantaneous frequency analysis
4)Wavelet transform
2.Application of the wavelet Transform will be briefly discussed.
1) Time series signal analysis
2) Image processing
3) Abnormal detection
4) Surface inspection
1. Basic theory of time-frequency analysis method will be briefly discussed.
1)Shot-Time Fourier transform
2)The Wigner-Ville Distribution
3)Hilbert Transform and instantaneous frequency analysis
4)Wavelet transform
2.Application of the wavelet Transform will be briefly discussed.
1) Time series signal analysis
2) Image processing
3) Abnormal detection
4) Surface inspection

Self Preparation and Review

Related subjects

Basic knowledge of the signal analysis
Basic knowledge of the signal analysis

Notes for textbook

Materials will be perpared by lecturer.
(Reference)
Y. Shimizu, Z. Zhang, R. Batres, Frontiers in computing technologies for Manufacturing applications, Springer, 2007.
M. Holschneider, "Wavelets and analysis", Oxford University Press.
L. Cohan, "Time-Frequency Analysis", Prentice-Hall PTR.
R.L. Allen, D.W. Mills, "Signal Analysis", IEEE Press.
Materials will be perpared by lecturer.
(Reference)
Y. Shimizu, Z. Zhang, R. Batres, Frontiers in computing technologies for Manufacturing applications, Springer, 2007.
M. Holschneider, "Wavelets and analysis", Oxford University Press.
L. Cohan, "Time-Frequency Analysis", Prentice-Hall PTR.
R.L. Allen, D.W. Mills, "Signal Analysis", IEEE Press.

Notes for reference

Goals to be achieved

Understanding the knowledge of the time-frequency analysis method and using them in real application
Understanding the knowledge of the time-frequency analysis method and using them in real application

Evaluation of achievement

Interim report (30%) and term-end report (70%)
Interim report (30%) and term-end report (70%)

Examination

Details of examination

Other information

Room: D-610, E-mail: zhang@pse.tut.ac.jp
Room: D-610, E-mail: zhang@pse.tut.ac.jp

Reference URL

http://is.pse.tut.ac.jp
http://is.pse.tut.ac.jp

Office hours

Relations to attainment objectives of learning and education

Key words

Wavelet transform, Time-frequency analysis
Wavelet transform, Time-frequency analysis

(M41630170)Advanced Applied Fluid Engineering[Advanced Applied Fluid Engineering]

Subject name[English]	Advanced Applied Fluid Engineering[Advanced Applied Fluid Engineering]				
Schedule number	M41630170	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Fall1 term	**Day of the week,period**	Mon.1～1	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	柳田　秀記 YANADA Hideki				
Numbering					

Objectives of class

The class treats the dynamics of fluid in a pipe, which is a typical distributed parameter system. The primary objectives of the class are to understand transient phenomena in a pipe, the theories that describe the dynamic behaviors of fluid, and the methods to analyze them.

The class treats the dynamics of fluid in a pipe, which is a typical distributed parameter system. The primary objectives of the class are to understand transient phenomena in a pipe, the theories that describe the dynamic behaviors of fluid, and the methods to analyze them.

Contents of class

1st week: One-dimensional wave equation and its solution in time domain for lossless lines
2nd week: Water hammer phenomenon
3rd week: Solution of wave equation in Laplace domain
4th week: Steady friction model and unsteady friction model, Propagation constant
5th week: Oscillatory laminar flow in pipe
6th week: Hydraulic impedance, reflection coefficient, and frequency response analysis
7th week: Characteristics method
8th week: Examination

1st week: One-dimensional wave equation and its solution in time domain for lossless lines
2nd week: Water hammer phenomenon
3rd week: Solution of wave equation in Laplace domain
4th week: Steady friction model and unsteady friction model, Propagation constant
5th week: Oscillatory laminar flow in pipe
6th week: Hydraulic impedance, reflection coefficient, and frequency response analysis
7th week: Characteristics method
8th week: Examination

Self Preparation and Review

Related subjects

Fluid mechanics, Mechanics, Laplace transform

Fluid mechanics, Mechanics, Laplace transform

Notes for textbook

Printed materials are given.
Referenc:Wylie, Streeter, Lisheng, Fluid Transients in Systems, McGraw-Hil

Printed materials are given.
Referenc:Wylie, Streeter, Lisheng, Fluid Transients in Systems, McGraw-Hil

Notes for reference

Goals to be achieved

To understand the transient phenomena that occur in a pipe.
To understand the fundamental theories that describe the dynamic behaviors of fluid in a pipe.

To understand the transient phenomena that occur in a pipe.
To understand the fundamental theories that describe the dynamic behaviors of fluid in a pipe.

Evaluation of achievement

Written reports:50%, Examination:50%
Written reports:50%, Examination:50%

Examination

Details of examination

Other information

Room: D309, E-mail: yanada@me.tut.ac.jp
Room: D309, E-mail: yanada@me.tut.ac.jp

Reference URL

Office hours

Basically, every time is OK. The time for discussion can be determined through e-mails when the lecturer is abscent from his office.
Basically, every time is OK. The time for discussion can be determined through e-mails when the lecturer is abscent from his office.

Relations to attainment objectives of learning and education

Key words

(M41630190)Applied Combustion Engineering[Applied Combustion Engineering]

Subject name[English]	Applied Combustion Engineering[Applied Combustion Engineering]				
Schedule number	M41630190	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Fall1 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	野田　進 NODA Susumu				
Numbering					

Objectives of class

The global environment is a subject we must consider in our engineering activities. Some pollutions come from combustion and disperse into the atmosphere. Such phenomena take place in turbulent reacting flows. In the class, the mathematical treatment of such flows will be lectured. In paticular, we focus on modeling of turbulent combustion based on stochastic methods.

The global environment is a subject we must consider in our engineering activities. Some pollutions come from combustion and disperse into the atmosphere. Such phenomena take place in turbulent reacting flows. In the class, the mathematical treatment of such flows will be lectured. In paticular, we focus on modeling of turbulent combustion based on stochastic methods.

Contents of class

1.Introduction
2.Premixed combustion
3.Nonpremixed combustion
4.Turbulent combustion
5.Statistical description of turbulent combustion
6.Flamelet model
7.Probability density function(pdf) model
8.Examination

This class ought to open in alternate years, thus see the teaching schedule.

1.Introduction
2.Premixed combustion
3.Nonpremixed combustion
4.Turbulent combustion
5.Statistical description of turbulent combustion
6.Flamelet model
7.Probability density function(pdf) model
8.Examination

This class ought to open in alternate years, thus see the teaching schedule.

Self Preparation and Review

Related subjects

Fundamental knowledge of the fluid dynamics is required, but the statistics and the stochastics will be lectured with basic contents.

Fundamental knowledge of the fluid dynamics is required, but the statistics and the stochastics will be lectured with basic contents.

Notes for textbook

Prints will be distributed.

(Reference)
Principles of Combustion, Kuo,K.K., John Wiley & Sons

Prints will be distributed.

(Reference)
Principles of Combustion, Kuo,K.K., John Wiley & Sons

Notes for reference

Goals to be achieved

Governing equations of turbulent combustion are derivable from fundamental equations.

Governing equations of turbulent combustion are derivable from fundamental equations.

Evaluation of achievement

Evaluation is based on an examination and reports.

Evaluation is based on an examination and reports.

Examination

Details of examination

Other information

Room: D411, Tel.(Ext.): 6681, e-mail: noda@me.tut.ac.jp

Room: D411, Tel.(Ext.): 6681, e-mail: noda@me.tut.ac.jp

Reference URL

http://www.mech.tut.ac.jp/~noda/

http://www.mech.tut.ac.jp/~noda/

Office hours

Any time in afternoon

Any time in afternoon

Relations to attainment objectives of learning and education

Key words

(M41630210)Advanced Mechanical Systems Design I[Advanced Mechanical Systems Design I]

Subject name[English]	Advanced Mechanical Systems Design I[Advanced Mechanical Systems Design I]				
Schedule number	M41630210	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**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

(M41630230)Advanced Materials and Manufacturing Process I[Advanced Materials and Manufacturing Process I]

Subject name[English]	Advanced Materials and Manufacturing Process I[Advanced Materials and Manufacturing Process I]				
Schedule number	M41630230	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**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

(M41630250)Advanced System, Control and Robotics I[Advanced System, Control and Robotics I]

Subject name[English]	Advanced System, Control and Robotics I[Advanced System, Control and Robotics I]				
Schedule number	M41630250	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**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

(M41630270)Advanced Energy and Environmental Engineering I[Advanced Energy and Environmental Engineering I]

Subject name[English]	Advanced Energy and Environmental Engineering I[Advanced Energy and Environmental Engineering I]				
Schedule number	M41630270	**Subject area**	Advanced Mechanical Engineering	**Required or elective**	Elective
Time of starting a course	Fall term	**Day of the week,period**	Fri.4～4	**Credit(s)**	2
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 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

(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

(M42630010)Material Science for Electronics[Material Science for Electronics]

Subject name[English]	Material Science for Electronics[Material Science for Electronics]				
Schedule number	M42630010	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	井上　光輝, 服部　敏明, 武藤　浩行, 石山　武 INOUE Mitsuteru, HATTORI Toshiaki, MUTO Hiroyuki, ISHIYAMA Takeshi				
Numbering					

Objectives of class

Objectives of this subject are to understand the fundamental aspects on spin electronics, electrochemical sensing, powder processing and photonics and have overall knowledge on the latest technologies on these physical phenomena.

Objectives of this subject are to understand the fundamental aspects on spin electronics, electrochemical sensing, powder processing and photonics and have overall knowledge on the latest technologies on these physical phenomena.

Contents of class

"Material Science for Electronics" is composed of four topics of spin electronics, electrochemical sensing, powder processing and photonics, which will be delivered for three times for each by three professors whose expertise lie on the individual categories.

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

Electrochemical sensor includes electrical, electronic and/or optical devices. In particular, the lecture aims for the understanding of sensing and determination of compounds in aqueous solution. 1) Electrochemistry. 2) Solution chemistry. 3) Application of electrochemical sensing.

The category of "powder processing" covers a wide area of fabrication techniques for electronic devices. 1) sintering, 2) micrstructute of ceramics and 3) nanocomposite.

The course of photonics is devoted to the survey of optoelectronic materials based on semiconductor physics and also to industrial applications of photonic devices. 1) Optoelectronic devices, 2) optical processes in semiconductors and exciton, 3) nanomaterial.

"Material Science for Electronics" is composed of four topics of spin electronics, electrochemical sensing, powder processing and photonics, which will be delivered for three times for each by three professors whose expertise lie on the individual categories.

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

Electrochemical sensor includes electrical, electronic and/or optical devices. In particular, the lecture aims for the understanding of sensing and determination of compounds in aqueous solution. 1) Electrochemistry. 2) Solution chemistry. 3) Application of electrochemical sensing.

The category of "powder processing" covers a wide area of fabrication techniques for electronic devices. 1) sintering, 2) micrstructute of ceramics and 3) nanocomposite.

The course of photonics is devoted to the survey of optoelectronic materials based on semiconductor physics and also to industrial applications of photonic devices. 1) Optoelectronic devices, 2) optical processes in semiconductors and exciton, 3)

nanomaterial.

Self Preparation and Review

Related subjects

Notes for textbook

None

None

Notes for reference

Goals to be achieved

(1) To understand fundamental aspects on spin electronics, electrochemical sensing, powder processing and photonics.

(2) To get the knowledge on the latest technologies on these physical phenomena.

(1) To understand fundamental aspects on spin electronics, electrochemical sensing, powder processing and photonics.

(2) To get the knowledge on the latest technologies on these physical phenomena.

Evaluation of achievement

Examination results 20% for each categories (spin electronics, electrochemical sensing, powder processing and photonics) and 20% report, then the final evaluation will be the sum of these marks.

Examination results 20% for each categories (spin electronics, electrochemical sensing, powder processing and photonics) and 20% report, then the final evaluation will be the sum of these marks.

Examination

Details of examination

Other information

Spin electronics; Mitsuteru Inoue: inoue@ee.tut.ac.jp

Electrochemical sensing: Toshiaki Hattori: thattori@ee.tut.ac.jp

Powder processing: Hiroyuki Muto: muto@ee.tut.ac.jp

Photonics; Takeshi Ishiyama: ishiyama@ee.tut.ac.jp

Spin electronics; Mitsuteru Inoue: inoue@ee.tut.ac.jp

Electrochemical sensing: Toshiaki Hattori: thattori@ee.tut.ac.jp

Powder processing: Hiroyuki Muto: muto@ee.tut.ac.jp

Photonics; Takeshi Ishiyama: ishiyama@ee.tut.ac.jp

Reference URL

Office hours

one hour after every classes

one hour after every classes

Relations to attainment objectives of learning and education

Key words

spin electronics, electrochemical sensing, powder processing and photonics

spin electronics, electrochemical sensing, powder processing and photonics

(M42630030)Electrical Energy Systems[Electrical Energy Systems]

Subject name[English]	Electrical Energy Systems[Electrical Energy Systems]				
Schedule number	M42630030	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	長尾　雅行, 滝川　浩史, 櫻井　庸司, 穂積　直裕 NAGAO Masayuki, TAKIKAWA Hirofumi, SAKURAI Yoji, HOZUMI Naohiro				
Numbering					

Objectives of class

This lecture is implemented as an introduction to electrical energy systems. In order to utilize electric energy in various fields, lectrues on the generation, transmission, distribution and control of electric energy, high voltage engineering, secondary batteries and fuel cells, discharge plasma are given. It is being useful as reference and self-study guide for the professional dealing with this important area. There are four sub courses to choose from.

This lecture is implemented as an introduction to electrical energy systems. In order to utilize electric energy in various fields, lectrues on the generation, transmission, distribution and control of electric energy, high voltage engineering, secondary batteries and fuel cells, discharge plasma are given. It is being useful as reference and self-study guide for the professional dealing with this important area. There are four sub courses to choose from.

Contents of class

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

Sub Course 2
1. Introduction to Electrochemical Energy Conversion Devices
2. Lithium Secondary Batteries and Fuel Cells
3. Recent Trend in Electrochemical Energy Conversion Devices

Sub Course 3
1. Generation and control of discharge plasma
2. Characteristics and diagnostics of discharge plasma
3. Plasma applications

Sub Course 4
1. Ultrasonic techniques for medical use.
2. Diagnosing techniques for industrial use.
3. Assessment for high voltage insulation system.

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

Sub Course 2
1. Introduction to Electrochemical Energy Conversion Devices
2. Lithium Secondary Batteries and Fuel Cells
3. Recent Trend in Electrochemical Energy Conversion Devices

Sub Course 3
1. Generation and control of discharge plasma
2. Characteristics and diagnostics of discharge plasma
3. Plasma applications

Sub Course 4
1. Ultrasonic techniques for medical use.
2. Diagnosing techniques for industrial use.
3. Assessment for high voltage insulation system.

Self Preparation and Review

Related subjects

Electric Power Systems, Dielectrics and Electrical Insulation, Energy Conversion, Plasma Science

Electric Power Systems, Dielectrics and Electrical Insulation, Energy Conversion, Plasma Science

Notes for textbook

Materials will be prepared by the lecturer.

Materials will be prepared by the lecturer.

Notes for reference

Goals to be achieved

To understand the basic knowledge of electric enrgy systems and related fields.

To understand the basic knowledge of electric enrgy systems and related fields.

Evaluation of achievement

Marks are based on the final examination or report (100%).

Marks are based on the final examination or report (100%).

Examination

Details of examination

Other information

Office: C-309, TEL: 0532-44-6725, E-mail: nagao@tut.jp

Office: C-309, TEL: 0532-44-6725, E-mail: nagao@tut.jp

Reference URL

Office hours

Before and/or after the lecture and at any time after making the appointment based on e-mail.

Before and/or after the lecture and at any time after making the appointment based on e-mail.

Relations to attainment objectives of learning and education

Key words

Electric Energy, Electric Power. High Voltage, Secondary Battery, Fuel Cell, Plasma, Electrical Insulation

Electric Energy, Electric Power. High Voltage, Secondary Battery, Fuel Cell, Plasma, Electrical Insulation

(M42630060)LSI Process[LSI Process]

Subject name[English]	LSI Process[LSI Process]				
Schedule number	M42630060	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	石田　誠, 澤田　和明, 村上　裕二, 関口　寛人 ISHIDA Makoto, SAWADA Kazuaki, MURAKAMI Yuji, SEKIGUCHI Hiroto				
Numbering					

Objectives of class

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

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

Contents of class

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

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

Self Preparation and Review

Related subjects

The basic knowledge on the quantum mechanics, thermodynamics, and electronics are desirable.

Semiconductor Physics, Master course

The basic knowledge on the quantum mechanics, thermodynamics, and electronics are desirable.

Semiconductor Physics, Master course

Notes for textbook

Physics of Semiconducotr Devices
S.M.Sze, Willy

Physics of Semiconducotr Devices
S.M.Sze, Willy

Notes for reference

Goals to be achieved

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

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

Evaluation of achievement

Reports (50%) and Final examination (50%)

Reports (50%) and Final examination (50%)

Examination

Details of examination

Other information

M.Ishida (C-606)
ishida@ee.tut.ac.jp
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Yu.Murakami (C-606)
ymurakami@ee.tut.ac.jp

Reference URL

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

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

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

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

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

Office hours

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

Relations to attainment objectives of learning and education

Key words

(M42630080)Advanced Electronic Information System[Advanced Electronic Information System]

Subject name[English]	Advanced Electronic Information System[Advanced Electronic Information System]				
Schedule number	M42630080	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	市川 周一 ICHIKAWA Shuichi				
Numbering					

Objectives of class

The aims of this lecture:
(1) To understand various hardware algorithms for computer arithmetic,
(2) To understand various designs for computer arithmetic units.

The aims of this lecture:
(1) To understand various hardware algorithms for computer arithmetic,
(2) To understand various designs for computer arithmetic units.

Contents of class

Algorithm is a procedure for solving a mathematical problem in a finite number of steps. The required calculation time and memory space depend on the algorithm, even for the same problem. Thus, it is essential to select the best algorithm for a given set of conditions.

In digital hardware, an algorithm is realized as a logic design. This lecture aims to understand various hardware algorithms for computer arithmetic, together with the corresponding designs of arithmetic hardware.

Week 1: Introduction
Week 2, 3: Algorithms for addition
Week 4,5,6: Algorithms for multiplication
Week 7,8,9: Algorithms for division and square root
Week 10,11: Algorithms for elementary functions
Week 12: Floating-point arithmetic
Week 13: Pipelining
Week 14, 15: Custom computing hardware

Algorithm is a procedure for solving a mathematical problem in a finite number of steps. The required calculation time and memory space depend on the algorithm, even for the same problem. Thus, it is essential to select the best algorithm for a given set of conditions.

In digital hardware, an algorithm is realized as a logic design. This lecture aims to understand various hardware algorithms for computer arithmetic, together with the corresponding designs of arithmetic hardware.

Week 1: Introduction
Week 2, 3: Algorithms for addition
Week 4,5,6: Algorithms for multiplication
Week 7,8,9: Algorithms for division and square root
Week 10,11: Algorithms for elementary functions
Week 12: Floating-point arithmetic
Week 13: Pipelining
Week 14, 15: Custom computing hardware

Self Preparation and Review

Related subjects
Prerequisite:
Fundamental knowledge and skills of logic design, algorithms, and computer structure.

Prerequisite:
Fundamental knowledge and skills of logic design, algorithms, and computer structure.

Notes for textbook
The lecturer will provide the handouts of slides.
References are given for each topic whenever necessary.

The lecturer will provide the handouts of slides.
References are given for each topic whenever necessary.

Notes for reference

Goals to be achieved
(1) To understand various hardware algorithms for computer arithmetic,
(2) To understand various designs for computer arithmetic units.

(1) To understand various hardware algorithms for computer arithmetic,
(2) To understand various designs for computer arithmetic units.

Evaluation of achievement
Reports on specific items given in the lecture (50%).
Term examination on general items shown in the lecture (50%).

Reports on specific items given in the lecture (50%).
Term examination on general items shown in the lecture (50%).

Examination

Details of examination

Other information
Room C-404
ext. 6897
E-mail: ichikawa@tut.jp

Room C-404
ext. 6897
E-mail: ichikawa@tut.jp

Reference URL
http://www.ccs.ee.tut.ac.jp/~ichikawa/lecture/
http://www.ccs.ee.tut.ac.jp/~ichikawa/lecture/

Office hours
Please make an appointment for consultation with the lecturer via e-mail or direct communication in classroom.
Please make an appointment for consultation with the lecturer via e-mail or direct communication in classroom.

Relations to attainment objectives of learning and education

Key words

(M42630100)Methodology of R & D 1[Methodology of R & D 1]

Subject name[English]	Methodology of R & D 1[Methodology of R & D 1]				
Schedule number	M42630100	**Subject area**	Advanced Electrical and Electronic Information Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**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

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

Subject name[English]	Seminar on Computer Science and Engineering[Seminar on Computer Science and Engineering]				
Schedule number	M43610040	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Required
Time of starting a course	Year	**Day of the week,period**	Intensive	**Credit(s)**	6
Faculty	Graduate Program for Master's Degree			**Subject grade**	2～2
Department Offered	Computer Science and Engineering			**Beggining grade**	
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

(M43630100)Image Processing, Advanced[Image Processing, Advanced]

Subject name[English]	Image Processing, Advanced[Image Processing, Advanced]				
Schedule number	M43630100	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	金澤 靖, 菅谷 保之 KANAZAWA Yasushi, SUGAYA Yasuyuki				
Numbering					

Objectives of class

This course involves fundamentals and advanced issues on image processing and computer vision.

This course involves fundamentals and advanced issues on image processing and computer vision.

Contents of class

1-2: Fundamentals on projective geometry
3-4: Camera model
5-7: Epipolar geometry
8-10: 3-D reconstruction from two views
11-13: 3-D reconstruction from many views
14-15: Advanced issues
1-2: Fundamentals on projective geometry
3-4: Camera model
5-7: Epipolar geometry
8-10: 3-D reconstruction from two views
11-13: 3-D reconstruction from many views
14-15: Advanced issues

Self Preparation and Review

Related subjects

Geometry, Linear Algebra, Statistics.
Geometry, Linear Algebra, Statistics.

Notes for textbook

Handouts will be prepared.

(References)

- R.I. Hartley and A. Zisserman, Multiple View Geometry in Computer Vision, Cambridge University Press, 2000.
- D.A. Forsyth and J. Ponce, Computer Vision -- A Modern Approach --, Prentice Hall, 2003.

Handouts will be prepared.

(References)

- R.I. Hartley and A. Zisserman, Multiple View Geometry in Computer Vision, Cambridge University Press, 2000.
- D.A. Forsyth and J. Ponce, Computer Vision -- A Modern Approach --, Prentice Hall, 2003.

Notes for reference

Goals to be achieved

Understanding of the fundamentals and advanced issues on image processing and computer vision including:
– camera model,
– epipolar geometry,
– 3–D reconstruction from images.

Understanding of the fundamentals and advanced issues on image processing and computer vision including:
– camera model,
– epipolar geometry,
– 3–D reconstruction from images.

Evaluation of achievement

Grade will be determined by some reports for each area.

Grade will be determined by some reports for each area.

Examination

Details of examination

Other information

Room F–404, Ext. 6888, Email: kanazawa@cs.tut.ac.jp (Yasushi Kanazawa)
Room C–507, Ext. 6760, Email: sugaya@iim.cs.tut.ac.jp (Yasuyuki Sugaya)

Room F–404, Ext. 6888, Email: kanazawa@cs.tut.ac.jp (Yasushi Kanazawa)
Room C–507, Ext. 6760, Email: sugaya@iim.cs.tut.ac.jp (Yasuyuki Sugaya)

Reference URL

http://www.img.cs.tut.ac.jp/
http://www.iim.cs.tut.ac.jp/

http://www.img.cs.tut.ac.jp/
http://www.iim.cs.tut.ac.jp/

Office hours

Relations to attainment objectives of learning and education

Key words

image processing, computer vision

image processing, computer vision

(M43630150)Computer Systems, Advanced[Computer Systems, Advanced]

Subject name[English]	Computer Systems, Advanced[Computer Systems, Advanced]				
Schedule number	M43630150	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	小林　良太郎 KOBAYASHI Ryotaro				
Numbering					

Objectives of class

This lecture introduces some advanced topics on designing advanced computer systems.
This lecture introduces some advanced topics on designing advanced computer systems.

Contents of class

10/8, 10/15: Difference between wire delay and gate delay
10/22: Limitation of large scale componets
10/29, 11/5: Data dependences, control dependences, and resource constraints in pipeline
11/12: Complexity-effective computer architecture
11/19: Clustered VLIW
12/3, 12/10: Penalty reduction by using value prediction
12/17: Specialized register read/write mechanism
1/14,1/21: Communication-Parallelism Trace-off in multi processors
1/28: Flexible shared buffer managed by compiler
2/4, 2/18: Instruction level parallelism and thread level parallelism
10/8, 10/15: Difference between wire delay and gate delay
10/22: Limitation of large scale componets
10/29, 11/5: Data dependences, control dependences, and resource constraints in pipeline
11/12: Complexity-effective computer architecture
11/19: Clustered VLIW
12/3, 12/10: Penalty reduction by using value prediction
12/17: Specialized register read/write mechanism
1/14,1/21: Communication-Parallelism Trace-off in multi processors
1/28: Flexible shared buffer managed by compiler
2/4, 2/18: Instruction level parallelism and thread level parallelism

Self Preparation and Review

Related subjects

Notes for textbook

Course materials and references will be given by the lecturer.
Course materials and references will be given by the lecturer.

Notes for reference

Goals to be achieved

Students are required to obtain the knowledge on the above-mentioned items.
Students are required to obtain the knowledge on the above-mentioned items.

Evaluation of achievement

There will be some assignments. There will also be an examination. Attendance to all classes is compulsory. Absence without reasonable excuses will result in some penalty.
There will be some assignments. There will also be an examination. Attendance to all classes is compulsory. Absence without reasonable excuses will result in some penalty.

Examination

Details of examination

Other information

Ryotaro Kobayashi
Room: C-403
Tel: 6752
email: kobayashi@cs.tut.ac.jp

Ryotaro Kobayashi
Room: C-403
Tel: 6752
email: kobayashi@cs.tut.ac.jp

Reference URL

Office hours

Students are to make an appointment via e-mail if they want to see the lecturer.

Students are to make an appointment via e-mail if they want to see the lecturer.

Relations to attainment objectives of learning and education

Key words

Computer architecture, digital circuits, embedded systems, design automation

Computer architecture, digital circuits, embedded systems, design automation

(M43630240)Networking, Advanced 1[Networking, Advanced 1]

Subject name[English]	Networking, Advanced 1[Networking, Advanced 1]				
Schedule number	M43630240	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Fall1 term	**Day of the week,period**	Wed.1～1	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	梅村　恭司 UMEMURA Kyoji				
Numbering					

Objectives of class

The objective of this class is mastering both profound and advanced networking technologies. Precise protocols are lectured to enhance the knowledge of Internet.

The objective of this class is mastering both profound and advanced networking technologies. Precise protocols are lectured to enhance the knowledge of Internet.

Contents of class

1. Link Layer
2. Internet Protocol
3. Address Resolution Protocol
4. Internet Control Message Protocol
5. IP routing and Dynamic Routing Protocol
6. Transmission Control Protocol
7. TCP interactive and bulk data flow

1. Link Layer
2. Internet Protocol
3. Address Resolution Protocol
4. Internet Control Message Protocol
5. IP routing and Dynamic Routing Protocol
6. Transmission Control Protocol
7. TCP interactive and bulk data flow

Self Preparation and Review

Related subjects

The ability to write simple client/server programs are required.

The ability to write simple client/server programs are required.

Notes for textbook

TCP/IP Illustrated Volume. 1, The Protocols,
W. Richard Stevens, Addison-wesley

TCP/IP Illustrated Volume. 1, The Protocols,
W. Richard Stevens, Addison-wesley

Notes for reference

Goals to be achieved

The goal is to understand the way that computer network works precisely.
The goal is to understand the way that computer network works precisely.

Evaluation of achievement

Examination will be held in the last class.

Examination will be held in the last class.

Examination

Details of examination

Other information

C－304 umemura@tut.jp

C－304 umemura@tut.jp

Reference URL

http://www.ss.cs.tut.ac.jp/
http://www.ss.cs.tut.ac.jp/

Office hours

From 10:00AM to 13:00, Tue to Fri
(Appointment are strongly recommended)

From 10:00AM to 13:00, Tue to Fri
(Appointment are strongly recommended)

Relations to attainment objectives of learning and education

Key words

Computer Network, Distributed Systems
Computer Network, Distributed Systems

(M43630260)Advanced Robotics and Informatics 1[Advanced Robotics and Informatics 1]

Subject name[English]	Advanced Robotics and Informatics 1[Advanced Robotics and Informatics 1]				
Schedule number	M43630260	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Fall1 term	**Day of the week,period**	Tue.3～3	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	三浦 純 MIURA Jun				
Numbering					

Objectives of class

Fundamental and advanced issues in next-generation robotics will be
discussed. This part (part 1) deals with
scene recognition by sensor fusion, mobile robot localization and mapping, and action planning.
Fundamental and advanced issues in next-generation robotics will be
discussed. This part (part 1) deals with
scene recognition by sensor fusion, mobile robot localization and mapping, and action planning.

Contents of class

Weeks 1-8:(Miura)
- Scene recognition and action planning.
- Bayes filters and decision theory
- Mobile robot localization and mapping
- Action planning under uncertainty

Weeks 1-8:(Miura)
- Scene recognition and action planning.
- Bayes filters and decision theory
- Mobile robot localization and mapping
- Action planning under uncertainty

Self Preparation and Review

Related subjects

Fundamentals of linear algebra and probability theory.
Fundamentals of linear algebra and probability theory.

Notes for textbook

Handouts will be prepared.

(Reference)
- S. Thrun, W. Burgard, D. Fox, Probabilistic Robotics, MIT Press, 2005.

Handouts will be prepared.

(Reference)
- S. Thrun, W. Burgard, D. Fox, Probabilistic Robotics, MIT Press, 2005.

Notes for reference

Goals to be achieved

Understanding of the fundamentals of robotics including:
- sensing mechanisms and algorithms for scene recognition.
Understanding of the fundamentals of robotics including:
- sensing mechanisms and algorithms for scene recognition.

Evaluation of achievement

Grade will be determined by the report for each area.

Grade will be determined by the report for each area.

Examination

Details of examination

Other information

Room C-604, Ext. 6773, Email: jun.miura@tut.jp (Jun Miura)

Room C-604, Ext. 6773, Email: jun.miura@tut.jp (Jun Miura)

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(M43630270)Advanced Robotics and Informatics 2[Advanced Robotics and Informatics 2]

Subject name[English]	Advanced Robotics and Informatics 2[Advanced Robotics and Informatics 2]				
Schedule number	M43630270	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Fall2 term	**Day of the week,period**	Tue.3～3	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	岡田 美智男 OKADA Michio				
Numbering					

Objectives of class

Fundamental and advanced issues in next-generation robotics will be discussed such as social interaction and communication of robots.

Fundamental and advanced issues in next-generation robotics will be discussed such as social interaction and communication of robots.

Contents of class

- Situated cognition and biological-inspired robots
- Embodiment and social embeddedness
- Organizing social interaction in social robots
- Socially assistive robotics

- Situated cognition and biological-inspired robots
- Embodiment and social embeddedness
- Organizing social interaction in social robots
- Socially assistive robotics

Self Preparation and Review

Related subjects

Fundamentals of cognitive science.

Fundamentals of cognitive science.

Notes for textbook

Handouts will be prepared.

(References)

- R. Pfeifer, C. Scheier, Understanding Intelligence, MIT Press, 2001.

Handouts will be prepared.

(References)

- R. Pfeifer, C. Scheier, Understanding Intelligence, MIT Press, 2001.

Notes for reference

Goals to be achieved

Understanding of the fundamentals of robotics including:

- cognitive science for biologically-inspired robots and social robots.

Understanding of the fundamentals of robotics including:

- cognitive science for biologically-inspired robots and social robots.

Evaluation of achievement Grade will be determined by the report for each area. Grade will be determined by the report for each area.
Examination
Details of examination
Other information Room F-402, Ext, 6886, Email: okada@tut.jp　(Michio Okada) Room F-402, Ext, 6886, Email: okada@tut.jp　(Michio Okada)
Reference URL
Office hours
Relations to attainment objectives of learning and education
Key words

(M43630300)Complex Systems and Intelligent Informatics 1[Complex Systems and Intelligent Informatics 1]

Subject name[English]	Complex Systems and Intelligent Informatics 1[Complex Systems and Intelligent Informatics 1]				
Schedule number	M43630300	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Fall1 term	**Day of the week,period**	Wed.3～3	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	村越 一支 MURAKOSHI Kazushi				
Numbering					

Objectives of class

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

Contents of class

A. Introduction
What is complex and intelligent systems? Outline of the brain system.
B. Computational Neuroscience and Application-oriented Mathematical Models
What is computational Neuroscience and artificial neural networks?
C. Model Neurons
Structure of neurons, synapse, model neurons.
D. Learning at connected part of neurons (synapse)
Synaptic plasticity, spike-timing-dependent plasticity (STDP).
E. Simulation Methods
Numerical calculation methods for single neuron, neural network from single neuron.
F. Simulation Environments
Explanation and demonstration of simulation environments such as NEURON and GENESIS.
G. Self-organizing
What is self-organizing? Winner Takes All, Self-organizing map (SOM)
H. Reinforcement Learning
What is reinforcement learning, reinforcement learning in the brain, demonstration of reinforcement learning for controlling robot
I. Summary

1st week: A
2nd week: B
3rd week: C
4th week: D
5th week: E F
6th week: G
7th week: H I
A. Introduction
What is complex and intelligent systems? Outline of the brain system.
B. Computational Neuroscience and Application-oriented Mathematical Models
What is computational Neuroscience and artificial neural networks?
C. Model Neurons
Structure of neurons, synapse, model neurons.
D. Learning at connected part of neurons (synapse)
Synaptic plasticity, spike-timing-dependent plasticity (STDP).
E. Simulation Methods
Numerical calculation methods for single neuron, neural network from single neuron.
F. Simulation Environments
Explanation and demonstration of simulation environments such as NEURON and GENESIS.
G. Self-organizing

What is self-organizing? Winner Takes All, Self-organizing map (SOM)
H. Reinforcement Learning
What is reinforcement learning, reinforcement learning in the brain, demonstration of reinforcement learning for controlling robot
I. Summary

1st week: A
2nd week: B
3rd week: C
4th week: D
5th week: E F
6th week: G
7th week: H I

Self Preparation and Review

Related subjects

Notes for textbook
Handouts are distributed.

Handouts are distributed.

Notes for reference

Goals to be achieved
- Know complex and intelligent mathematical models, and understand them at the degree which you can simulte them by your programming or by using simulation environment.
- Can explain technical terms of complex and intelligent mathematical models.
- Master numerical calculation methods that are used in complex and intelligent mathematical models.

- Know complex and intelligent mathematical models, and understand them at the degree which you can simulte them by your programming or by using simulation environment.
- Can explain technical terms of complex and intelligent mathematical models.
- Master numerical calculation methods that are used in complex and intelligent mathematical models.

Evaluation of achievement
Examination 100% + alpha (Consideration, comment, and opinion in each content (A-H))
Examination 100% + alpha (Consideration, comment, and opinion in each content (A-H))

Examination

Details of examination

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

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

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

Office hours
After this class
After this class

Relations to attainment objectives of learning and education

Key words

(M43630310)Complex Systems and Intelligent Informatics 2[Complex Systems and Intelligent Informatics 2]

Subject name[English]	Complex Systems and Intelligent Informatics 2[Complex Systems and Intelligent Informatics 2]				
Schedule number	M43630310	**Subject area**	Advanced Computer Science and Engineering	**Required or elective**	Elective
Time of starting a course	Fall2 term	**Day of the week,period**	Wed.3～3	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	石田　好輝 ISHIDA Yoshiteru				
Numbering					

Objectives of class

This course provides opportunities to learn the followings:
* Modeling and analysis on complex systems and learning systems,
* System theoretic analysis on complex systems and learning systems ,
* Computer simulations and implications, and
* Implementation of complex systems and learning systems.
Recent topics on complex systems and learning systems will be also discussed in the course.

This course provides opportunities to learn the followings:
* Modeling and analysis on complex systems and learning systems,
* System theoretic analysis on complex systems and learning systems ,
* Computer simulations and implications, and
* Implementation of complex systems and learning systems.
Recent topics on complex systems and learning systems will be also discussed in the course.

Contents of class

1. Introduction on complex dynamical systems
2. Dynamical systems
3. Complex networks and interactions
4. Cellular automata and neural networks
5. Information Processing by complex systems
6. Emergence of cooperation in autonomous agents
7. Learning algorithms for agents
8. Evolutionary algorithms for agents
9. Biological systems and information processing

1. Introduction on complex dynamical systems
2. Dynamical systems
3. Complex networks and interactions
4. Cellular automata and neural networks
5. Information Processing by complex systems
6. Emergence of cooperation in autonomous agents
7. Learning algorithms for agents
8. Evolutionary algorithms for agents
9. Biological systems and information processing

Self Preparation and Review

Related subjects

Notes for textbook

No textbook. References other than below will be suggested at the first class.
Ishida, Y.: Immunity-Based Systems, Springer (2004);
Barabasi, A.L.: Linked, Perseus, (2002)
Strogatz, S. H. Sync, Hyperion (2003)

No textbook. References other than below will be suggested at the first class.

Ishida, Y.: Immunity-Based Systems, Springer (2004);
Barabasi, A.L.: Linked, Perseus, (2002)
Strogatz, S. H. Sync, Hyperion (2003)

Notes for reference

Goals to be achieved

Evaluation of achievement

Class performance (50%) and term-end report (50%)
Class performance (50%) and term-end report (50%)

Examination

Details of examination

Other information

Room F-504, Ext. 6895
Room F-504, Ext. 6895

Reference URL

Office hours

Wednesday 16:30-17:00
Wednesday 16:30-17:00

Relations to attainment objectives of learning and education

Key words

complex systems, cellular automaton, artificial life, immuno intelligence, neural networks, evolutionary game theory
complex systems, cellular automaton, artificial life, immuno intelligence, neural networks, evolutionary game theory

(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

(M44630010)Advanced Separation Chemistry I[Advanced Separation Chemistry I]

Subject name[English]	Advanced Separation Chemistry I[Advanced Separation Chemistry I]				
Schedule number	M44630010	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Fall1 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	齊戸　美弘 SAITO Yoshihiro				
Numbering					

Objectives of class

Due to the recent requirements for stationary phases in chromatography such as higher selectivity, various novel stationary phases have been developed by the systematic analysis of the retention behavior of sample solutes. Miniaturization and automation of the whole separation instruments have been regarded as additional important projects in separation science, because of the increasing requirements for recent separation systems, such as selective/specific detection with high sensitivities, high throughput processing, as well as an environmentally-friendly feature of the systems. In this course, novel technologies of sample preparation and chromatographic separations will be provided along with the miniaturization of the hyphenated analytical systems.

Due to the recent requirements for stationary phases in chromatography such as higher selectivity, various novel stationary phases have been developed by the systematic analysis of the retention behavior of sample solutes. Miniaturization and automation of the whole separation instruments have been regarded as additional important projects in separation science, because of the increasing requirements for recent separation systems, such as selective/specific detection with high sensitivities, high throughput processing, as well as an environmentally-friendly feature of the systems. In this course, novel technologies of sample preparation and chromatographic separations will be provided along with the miniaturization of the hyphenated analytical systems.

Contents of class

1. Development of novel stationary phases in liquid chromatography based on the systematic analysis of retention behavior.
2. Development of novel sample preparation media and the applications to real sample analysis in various chromatographic methods.
3. Miniaturization of analytical systems and the hyphenation.

1. Development of novel stationary phases in liquid chromatography based on the systematic analysis of retention behavior.
2. Development of novel sample preparation media and the applications to real sample analysis in various chromatographic methods.
3. Miniaturization of analytical systems and the hyphenation.

Self Preparation and Review

Related subjects

Advanced Separation Chemistry II.

Advanced Separation Chemistry II.

Notes for textbook

No text book is required, however, basic knowledge of chromatography is desirable.

No text book is required, however, basic knowledge of chromatography is desirable.

Notes for reference

Goals to be achieved

Evaluation of achievement

The evaluation will be made based on the score of the report and presentation.

The evaluation will be made based on the score of the report and presentation.

Examination

Details of examination

Other information

Y. Saito; Room# B-404; Phone 6803; E-mail: saito@ens.tut.ac.jp

Y. Saito; Room# B-404; Phone 6803; E-mail: saito@ens.tut.ac.jp

Reference URL

Office hours

Anytime if available, however, an appointment by e-mail is strongly recommended.

Anytime if available, however, an appointment by e-mail is strongly recommended.

Relations to attainment objectives of learning and education

Key words

(M44630020)Advanced Separation Chemistry II[Advanced Separation Chemistry II]

Subject name[English]	Advanced Separation Chemistry II[Advanced Separation Chemistry II]				
Schedule number	M44630020	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Fall2 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	平田　幸夫 HIRATA Yukio				
Numbering					

Objectives of class

Chromatography is one of the most widely applied methods for the analysis of mixtures, because of its high resolving power. Purpose of this course is to learn the basic theory of chromatography. To obtain the in-depth understanding, the emphasis is also placed on practice and reports on the related topics.

Chromatography is one of the most widely applied methods for the analysis of mixtures, because of its high resolving power. Purpose of this course is to learn the basic theory of chromatography. To obtain the in-depth understanding, the emphasis is also placed on practice and reports on the related topics.

Contents of class

1. Basic theory of chromatography
- distribution equilibrium
- plate theory
- rate theory
- resolution
- mobile and stationary phases

2. Practice and Repots for various simulation using Excel and Excel-VBA
- chromatographic separation process
- effect of various parameters on the separation efficiency
- effect of temperature in GC
- effect of mobile phase composition in LC
- analysis of chromatographic data

1. Basic theory of chromatography
- distribution equilibrium
- plate theory
- rate theory
- resolution
- mobile and stationary phases

2. Practice and Repots for various simulation using Excel and Excel-VBA
- chromatographic separation process
- effect of various parameters on the separation efficiency
- effect of temperature in GC
- effect of mobile phase composition in LC
- analysis of chromatographic data

Self Preparation and Review

Related subjects

Notes for textbook

Textbook

No textbook is required. Related materials will be provided. Elementary knowledge of Basic Language is required to use Excel-VBA.

Reference

1) "Chromatography: Concepts and Contrasts", J. M. Miller, John Wiley & Sons"

Textbook
No textbook is required. Related materials will be provided. Elementary knowledge of Basic Language is required to use Excel-VBA.

Reference
1) "Chromatography: Concepts and Contrasts", J. M. Miller, John Wiley & Sons"

Notes for reference

Goals to be achieved
To undersatnd the principle of chromatography.

To undersatnd the principle of chromatography.

Evaluation of achievement
Based on reports requested on individual chromatographic topic of interest during the course of class.

Based on reports requested on individual chromatographic topic of interest during the course of class.

Examination

Details of examination

Other information
Yukio Hirata: room (B-402), e-mail (hirata@ens.tut.ac.jp), phone: 6804

Yukio Hirata: room (B-402), e-mail (hirata@ens.tut.ac.jp), phone: 6804

Reference URL

Office hours
As needed.
As needed.

Relations to attainment objectives of learning and education

Key words

(M44630070)Advanced Polymer Chemistry[Advanced Polymer Chemistry]

Subject name[English]	Advanced Polymer Chemistry[Advanced Polymer Chemistry]				
Schedule number	M44630070	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Fall1 term	**Day of the week,period**	Tue.3～3	**Credit(s)**	1
Faculty	Graduate Program for Master's Degree			**Subject grade**	1～2
Department Offered				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	伊津野 真一 ITSUNO Shinichi				
Numbering					

Objectives of class

This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported organic chemistry will be discussed.

This course focuses on the synthetic aspects of polymer-supported chemistry. Several applications of solid-supported organic chemistry will be discussed.

Contents of class

(1) Preparation of functionalized monomers
(2) Preparation method of polymer-support
(3) Preparation of functional polymers by polymer reaction method
(4) Preparation of functional polymers by polymerization method
(5) Nucleophilic reactions on the functional polymer
(6) Electrophhilic reactions on the functional polymers
(7) Polymer-supported reagents
(8) Polymer-supported catalysts
(9) Asymmetric reaction using polymer-supported catalyst
(10) Solid phase peptide synthesis

(1) Preparation of functionalized monomers
(2) Preparation method of polymer-support
(3) Preparation of functional polymers by polymer reaction method
(4) Preparation of functional polymers by polymerization method
(5) Nucleophilic reactions on the functional polymer
(6) Electrophhilic reactions on the functional polymers
(7) Polymer-supported reagents
(8) Polymer-supported catalysts
(9) Asymmetric reaction using polymer-supported catalyst
(10) Solid phase peptide synthesis

Self Preparation and Review

Related subjects

Organic Chemistry
Polymer chemistry
Organic Chemistry
Polymer chemistry

Notes for textbook

No textbook will be used.
No textbook will be used.

Notes for reference

Goals to be achieved

1)To understand radical polymerization of vinyl monomers

2）To understand reactions of polymers
3）To understand the synthesis of optically active polymers
4）To understand the structure formation of peptides and proteins
1）To understand radical polymerization of vinyl monomers
2）To understand reactions of polymers
3）To understand the synthesis of optically active polymers
4）To understand the structure formation of peptides and proteins

Evaluation of achievement

The report on selected topics will be imposed.

The report on selected topics will be imposed.

Examination

Details of examination

Other information

B－502
6813
itsuno@ens.tut.ac.jp

B－502
6813
itsuno@ens.tut.ac.jp

Reference URL

http://ens.tut.ac.jp/chiral/index.html
http://ens.tut.ac.jp/chiral/index.html

Office hours

Any time
Any time

Relations to attainment objectives of learning and education

Key words

Polymer reaction, Optically active polymers, Polymeric catalyst, Asymmetric reactions, Peptide
Polymer reaction, Optically active polymers, Polymeric catalyst, Asymmetric reactions, Peptide

(M44630080)Advanced Polymer Engineering[Advanced Polymer Engineering]

Subject name[English]	Advanced Polymer Engineering[Advanced Polymer Engineering]				
Schedule number	M44630080	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Fall2 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	吉田　絵里 YOSHIDA Eri				
Numbering					

Objectives of class

1.To acquire knowledge of advanced polymer syntheses including well-controlled polymerizations and heterogeneous polymerizations in supercritical fluid.
2.To understand molecular self-assembly in vivo and in vitro.
1.To acquire knowledge of advanced polymer syntheses including well-controlled polymerizations and heterogeneous polymerizations in supercritical fluid.
2.To understand molecular self-assembly in vivo and in vitro.

Contents of class

1. Advanced polymer syntheses
1) Controlled radical polymerization 1
2) Controlled radical polymerization 2
3) Molecular design through living radical polymerization
4) Heterogeneous polymerizations
5) Polymerization in supercritical carbon dioxide

2. Molecular self-assembly
1) Theory of molecular self-assembly 1: Surfactnat
2) Theory of molecular self-assembly 2: Vital tissue
3) Artificial supramolecules

1. Advanced polymer syntheses
1) Controlled radical polymerization 1
2) Controlled radical polymerization 2
3) Molecular design through living radical polymerization
4) Heterogeneous polymerizations
5) Polymerization in supercritical carbon dioxide

2. Molecular self-assembly
1) Theory of molecular self-assembly 1: Surfactnat
2) Theory of molecular self-assembly 2: Vital tissue
3) Artificial supramolecules

Self Preparation and Review

Related subjects

Basic knowledge of polymer chemistry is desirable.
Basic knowledge of polymer chemistry is desirable.

Notes for textbook

No textbook is needed.
No textbook is needed.

Notes for reference

Goals to be achieved To understand cutting-edge technology based on well-defined polymers. To understand cutting-edge technology based on well-defined polymers.
Evaluation of achievement An examination and term-end report An examination and term-end report
Examination
Details of examination
Other information Eri Yoshida; room: B-503, Tel: 6814, e-mail: eyoshida@ens.tut.ac.jp Eri Yoshida; room: B-503, Tel: 6814, e-mail: eyoshida@ens.tut.ac.jp
Reference URL http://www.ens.tut.ac.jp/~eyoshida http://www.ens.tut.ac.jp/~eyoshida
Office hours Anytime Anytime
Relations to attainment objectives of learning and education
Key words Free-radical polymerization, Living radical polymerization, Molecular self-assembly Free-radical polymerization, Living radical polymerization, Molecular self-assembly

(M44630090)Advanced Composite Science[Advanced Composite Science]

Subject name[English]	Advanced Composite Science[Advanced Composite Science]				
Schedule number	M44630090	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Fall1 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	竹市　力 TAKEICHI Tsutomu				
Numbering					

Objectives of class

The objective of this course is to obtain basic understanding of various composite materials by studying them from the viewpoint of materials chemistry, synthetic chemistry, polymer chemistry, physical chemistry, and inorganic chemistry.

The objective of this course is to obtain basic understanding of various composite materials by studying them from the viewpoint of materials chemistry, synthetic chemistry, polymer chemistry, physical chemistry, and inorganic chemistry.

Contents of class

(1) FRP: General Purpose FRP and Advanced FRP
– Characteristics and Application –
(2) Reinforcing Fibers
– Various Types and Characteristics –
(3) Fabrication of composite materials
(4) Matrix Resin
– Various Types and Characteristics –
(5) Molecular Composites
– Concept and Possibility as Novel Composite Materials –
(6) C/C composites
(7) Organic–Inorganic Hybrid Nanocomposites
– Concept, Characteristics, and Possibility as Novel Materials –
(8) Polymer alloys and polymer blends

(1) FRP: General Purpose FRP and Advanced FRP
– Characteristics and Application –
(2) Reinforcing Fibers
– Various Types and Characteristics –
(3) Fabrication of composite materials
(4) Matrix Resin
– Various Types and Characteristics –
(5) Molecular Composites
– Concept and Possibility as Novel Composite Materials –
(6) C/C composites
(7) Organic–Inorganic Hybrid Nanocomposites
– Concept, Characteristics, and Possibility as Novel Materials –
(8) Polymer alloys and polymer blends

Self Preparation and Review

Related subjects

Basic knowledge of polymer synthesis and polymeric materials is desirable.

Basic knowledge of polymer synthesis and polymeric materials is desirable.

Notes for textbook

Handouts will be provided.

Handouts will be provided.

Notes for reference

Goals to be achieved

The goals to be achieved is to obtain basic understanding of various composite materials from the viewpoint of materials chemistry, synthetic chemistry, polymer chemistry, physical chemistry, and inorganic chemistry.

The goals to be achieved is to obtain basic understanding of various composite materials from the viewpoint of materials chemistry, synthetic chemistry, polymer chemistry, physical chemistry, and inorganic chemistry.

Evaluation of achievement

The report on selected topics will be imposed.

The report on selected topics will be imposed.

Examination

Details of examination

Other information

Tsutomu Takeichi: room (B-504), e-mail: takeichi@tutms.tut.ac.jp

Tsutomu Takeichi: room (B-504), e-mail: takeichi@tutms.tut.ac.jp

Reference URL

http://www.tutms.tut.ac.jp/

http://www.tutms.tut.ac.jp/

Office hours

Relations to attainment objectives of learning and education

Key words

Polymer, Composites, FRP, Thermal and Physical Properties

Polymer, Composites, FRP, Thermal and Physical Properties

(M44630120)Advanced Molecular Life Science[Advanced Molecular Life Science]

Subject name[English]	Advanced Molecular Life Science[Advanced Molecular Life Science]				
Schedule number	M44630120	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Fall1 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	田中　照通 TANAKA Terumichi				
Numbering					

Objectives of class

This course will provide students with the opportunity to read excellent research papers on molecular life science. Therefore, the knowledge of basic biochemistry and molecular biology is absolutely necessary. If you have not completed these subjects, you are not qualified for this course.
The papers used in the Class are important papers from that current molecular life science were originated. The students will be required to read, summarize and present two or more research papers.
This course will provide students with the opportunity to read excellent research papers on molecular life science. Therefore, the knowledge of basic biochemistry and molecular biology is absolutely necessary. If you have not completed these subjects, you are not qualified for this course.
The papers used in the Class are important papers from that current molecular life science were originated. The students will be required to read, summarize and present two or more research papers.

Contents of class

This Class goes with the "Original Papers" of the "Nobel Prize Laureates".
At first, students must access the HP of Nobel Prize Organization: http://nobelprize.org//
Next, choose two "Nobel Prize Awards" after 1970 in the field of "Physiology and Medicine" or "Chemistry", and Get and Read carefully "original papers" of the Laureates. ("Nobel Prize Awards" must be strongly related to biology if you choose from "Chemistry")

After that, every student will have presentation for the chosen "Award".
In the presentation, student must explain plainly the background of the research, the content of the research, and the effects of the research.
This Class goes with the "Original Papers" of the "Nobel Prize Laureates".
At first, students must access the HP of Nobel Prize Organization: http://nobelprize.org//
Next, choose two "Nobel Prize Awards" after 1970 in the field of "Physiology and Medicine" or "Chemistry", and Get and Read carefully "original papers" of the Laureates. ("Nobel Prize Awards" must be strongly related to biology if you choose from "Chemistry")

After that, every student will have presentation for the chosen "Award".
In the presentation, student must explain plainly the background of the research, the content of the research, and the effects of the research.

Self Preparation and Review

Related subjects

Advanced Applied Biochemistry and Biotechnology
Advanced Applied Biochemistry and Biotechnology

Notes for textbook

see the HP of "Nobel Prize" Organization: http://nobelprize.org/
you can get the (list of) Original Papers in the Web site.
see the HP of "Nobel Prize" Organization: http://nobelprize.org/
you can get the (list of) Original Papers in the Web site.

Notes for reference

Goals to be achieved

The goal is to be able to deeply understand excellent papers and modern history of molecular life science.
The goal is to be able to deeply understand excellent papers and modern history of molecular life science.

Evaluation of achievement

Grades for the course will be based on the test score or the report and presentation score.

Grades for the course will be based on the test score or the report and presentation score.

Examination

Details of examination

Other information

Terumichi TANAKA: Room: G-506, Phone: 6920, E-mail: terumichi-tanaka@tut.jp

Terumichi TANAKA: Room: G-506, Phone: 6920, E-mail: terumichi-tanaka@tut.jp

Reference URL

none

none

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

Key words

Molecular Biology, RNA, DNA, gene

Molecular Biology, RNA, DNA, gene

(M44630130)Advanced Applied Biochemistry and Biotechnology[Advanced Applied Biochemistry and Biotechnology]

Subject name[English]	Advanced Applied Biochemistry and Biotechnology[Advanced Applied Biochemistry and Biotechnology]				
Schedule number	M44630130	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Fall2 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	平石 明, 浴 俊彦 HIRAISHI Akira, EKI Toshihiko				
Numbering					

Objectives of class

1. Applied Microbiology and Biochemistry: Fundamentals of microbiology and bioenergetics and their applications to fermentation technology and environmental biotechnology
2. Molecular Biology and Genomics: Principle and current progress in genome sciences will be discussed.

1. Applied Microbiology and Biochemistry: Fundamentals of microbiology and bioenergetics and their applications to fermentation technology and environmental biotechnology
2. Molecular Biology and Genomics: Principle and current progress in genome sciences will be discussed.

Contents of class

1. Applied Microbiology and Biochemistry
1) Introduction of microbiology – Biodiversity, taxonomy and physiology of microorganisms
2) Fundamentals of bioenergetics
3) Modes of microbial energy-yielding systems
4) Industrial microbiology and environmental biotechnology
2. Molecular Biology and Genomics
1) Introduction of genome research
2) Mapping and Sequencing technology
3) Functional genomics

1. Applied Microbiology and Biochemistry
1) Introduction of microbiology – Biodiversity, taxonomy and physiology of microorganisms
2) Fundamentals of bioenergetics
3) Modes of microbial energy-yielding systems
4) Industrial microbiology and environmental biotechnology
2. Molecular Biology and Genomics
1) Introduction of genome research
2) Mapping and Sequencing technology
3) Functional genomics

Self Preparation and Review

Related subjects

The knowledge of basic microbiology, biochemistry and molecular biology is absolutely required.

The knowledge of basic microbiology, biochemistry and molecular biology is absolutely required.

Notes for textbook

For Applied Microbiology and Biochemistry:
M. T. Madigan et al."Brock Biology of Microorganisms" Prentice Hall
For Molecular Biology and Genomics
S. B. Primrose and R. M. Twyman "Principles of Genome Analysis and Genomics" 3rd Ed. Blackwell Science

For Applied Microbiology and Biochemistry:
M. T. Madigan et al."Brock Biology of Microorganisms" Prentice Hall
For Molecular Biology and Genomics
S. B. Primrose and R. M. Twyman "Principles of Genome Analysis and Genomics" 3rd Ed. Blackwell Science

Notes for reference

Goals to be achieved

The aims of the lesson are to get basic knowledge of applied microbiology, genomics and molecular biology and to understand

the current technology in the field of these researches.
The aims of the lesson are to get basic knowledge of applied microbiology, genomics and molecular biology and to understand the current technology in the field of these researches.

Evaluation of achievement

Grades for the course will be based on the average of the subjects score (Hiraishi and Eki).
Interim report (30%) and term-end report (70%) for Applied Microbiology and Biochemistry (Hiraishi).
Presentation (30%) and term-end report (70%) for Molecular Biology and Genomics (Eki).
Grades for the course will be based on the average of the subjects score (Hiraishi and Eki).
Interim report (30%) and term-end report (70%) for Applied Microbiology and Biochemistry (Hiraishi).
Presentation (30%) and term-end report (70%) for Molecular Biology and Genomics (Eki).

Examination

Details of examination

Other information

Prof. Akira Hiraishi (G503) Tel: 6913, e-mail: hiraishi@ens.tut.ac.jp
Prof. Toshihiko Eki (G505) Tel: 6907, e-mail: eki@ens.tut.ac.jp
Prof. Akira Hiraishi (G503) Tel: 6913, e-mail: hiraishi@ens.tut.ac.jp
Prof. Toshihiko Eki (G505) Tel: 6907, e-mail: eki@ens.tut.ac.jp

Reference URL

Office hours

Please make an appointment.
Please make an appointment.

Relations to attainment objectives of learning and education

Key words

microbiology, applied biochemistry, molecular biology, genomics
microbiology, applied biochemistry, molecular biology, genomics

(M44630210)Advanced Life Science and Biotechnology I[Advanced Life Science and Biotechnology I]

Subject name[English]	Advanced Life Science and Biotechnology I[Advanced Life Science and Biotechnology I]				
Schedule number	M44630210	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Fall term	**Day of the week,period**	Intensive	**Credit(s)**	2
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 4kei kyomu Iin-S				
Numbering					

Objectives of class

This course will provide the students with the opportunity to study on selected subjects in the realm of advanced life science and biotechnology.

This course will provide the students with the opportunity to study on selected subjects in the realm of advanced life science and biotechnology.

Contents of class

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

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

Self Preparation and Review

Related subjects

Advanced Life Science and Biotechnology II

Advanced Life Science and Biotechnology II

Notes for textbook

Supervisor will recommend textbooks and papers to students.

Supervisor will recommend textbooks and papers to students.

Notes for reference

Goals to be achieved

To acquire advanced knowledge on life science and biotechnology

To be able to report and discuss the contents of textbooks and papers he/she has read.

To acquire advanced knowledge on life science and biotechnology

To be able to report and discuss the contents of textbooks and papers he/she has read.

Evaluation of achievement

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

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 Life science, biotechnology, bioengineering, molecular biology, microbiology, genomics Life science, biotechnology, bioengineering, molecular biology, microbiology, genomics

(M44630230)Advanced Environmental Technology I[Advanced Environmental Technology I]

Subject name[English]	Advanced Environmental Technology I[Advanced Environmental Technology I]				
Schedule number	M44630230	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Fall term	**Day of the week,period**	Intensive	**Credit(s)**	2
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 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 advanced environmental science and technology.

This course will provide the students with the opportunity to study on the selected subject in the realm of advanced environmental science and technology.

Contents of class

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

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

Self Preparation and Review

Related subjects

Advanced Environmental Technology II

Advanced Environmental Technology II

Notes for textbook

Supervisor will recommend textbooks and papers to students.

Supervisor will recommend textbooks and papers to students.

Notes for reference

Goals to be achieved

To acquire advanced knowledge on environmental science and technology

To be able to report and discuss the contents of textbooks and papers he/she has read.

To acquire advanced knowledge on environmental science and technology

To be able to report and discuss the contents of textbooks and papers he/she has read.

Evaluation of achievement

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

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

Environmental science, environmental technology, eco-technology, environmental engineering
Environmental science, environmental technology, eco-technology, environmental engineering

(M44630250)Advanced Environmental and Ecological Systems I[Advanced Environmental and Ecological Systems I]

Subject name[English]	Advanced Environmental and Ecological Systems I[Advanced Environmental and Ecological Systems I]				
Schedule number	M44630250	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Fall term	**Day of the week,period**	Intensive	**Credit(s)**	2
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 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 advanced environmental and ecological systems.

This course will provide the students with the opportunity to study on the selected subject in the realm of advanced environmental and ecological systems.

Contents of class

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

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

Self Preparation and Review

Related subjects

Notes for textbook

Supervisor will recommend textbooks and papers to students.

Supervisor will recommend textbooks and papers to students.

Notes for reference

Goals to be achieved

To acquire advanced knowledge on environmental science and technology and ecological systems

To be able to report and discuss the contents of textbook and papers he/she has read.

To acquire advanced knowledge on environmental science and technology and ecological systems

To be able to report and discuss the contents of textbook and papers he/she has read.

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
Ecological systems, industrial ecology, environmental technology, materials flows
Ecological systems, industrial ecology, environmental technology, materials flows

(M44630270)Special Topics in Inorganic Chemistry[Special Topics in Inorganic Chemistry]

Subject name[English]	Special Topics in Inorganic Chemistry[Special Topics in Inorganic Chemistry]				
Schedule number	M44630270	**Subject area**	Advanced Environmental and Life Sciences	**Required or elective**	Elective
Time of starting a course	Fall2 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	角田 範義 KAKUTA Noriyoshi				
Numbering					

Objectives of class

The chemistry and physics of surfaces is an increasingly important subject. Because of this, there is a need for chemists to become familiar with the basic concepts and principles governing interfacial phenomena for understanding "Heterogeneous Catalysis".

The chemistry and physics of surfaces is an increasingly important subject. Because of this, there is a need for chemists to become familiar with the basic concepts and principles governing interfacial phenomena for understanding "Heterogeneous Catalysis".

Contents of class

I. What is catalysis?
The reactive interface

II. What is catalyst?
Catalytic materials and their preparation
Catalytic activity and selectivity
Measurement of catalytic properties

III. Catalysis for benefit of humans
Raw materials and their conversion
Catalysis for environmental protection
Catalysis in everyday life
Catalysis for the future

I. What is catalysis?
The reactive interface

II. What is catalyst?
Catalytic materials and their preparation
Catalytic activity and selectivity
Measurement of catalytic properties

III. Catalysis for benefit of humans
Raw materials and their conversion
Catalysis for environmental protection
Catalysis in everyday life
Catalysis for the future

Self Preparation and Review

Related subjects

Basic knowledges of physical chemistry and inorganic chemistry are required.

Basic knowledges of physical chemistry and inorganic chemistry are required.

Notes for textbook

No official textbook is used.
Hand out materials accordingly.
No official textbook is used.
Hand out materials accordingly.

Notes for reference

Goals to be achieved

To understand basics of heterogeneous catalysis and catalyst
To understand basics of heterogeneous catalysis and catalyst

Evaluation of achievement

30% Homework report, 70% Final examination or report
30% Homework report, 70% Final examination or report

Examination

Details of examination

Other information

Room # B-302, E-mail: kakuta@ens.tut.ac.jp,
Room # B-302, E-mail: kakuta@ens.tut.ac.jp,

Reference URL

Office hours

Anytime when I will be.
Anytime when I will be.

Relations to attainment objectives of learning and education

Key words

adsorption, solid surface, heterogeneous catalysis
adsorption, solid surface, heterogeneous catalysis

(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

(M45630010)Elasticity and Stability[Elasticity and Stability]

Subject name[English]	Elasticity and Stability[Elasticity and Stability]				
Schedule number	M45630010	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	齊藤　大樹 SAITOH Taiki				
Numbering					

Objectives of class

This lecture is concerned with the static continuum mechanics of elastic 2-dimensional bodies. The primary purpose is to encourage students to gain the fundamental concept and to raise their potential abilities for advanced and practical applications in the future.

This lecture is concerned with the static continuum mechanics of elastic 2-dimensional bodies. The primary purpose is to encourage students to gain the fundamental concept and to raise their potential abilities for advanced and practical applications in the future.

Contents of class

1. Introduction
2. Tensor Analysis in Cartesian Coordinates
2.1 Summation Convention
2.2 Translation of coordinate
2.3 Scalar, Vector and Tensor
2.4 Quotient Rule
3. Stresses and Equilibrium
3.1 Stress
3.2 Equilibrium of Stresses
3.3 Cauchy's Relation
3.4 Principal Stress and Stress Invariant
4. Strain-Displacement Relations in Two-Dimensional Bodies
4.1 Deflection
4.2 Strain
5. Constitutive Equations in Isotropic Elastic Materials
5.1 Stress-strain Relations of Linear Elastic Bodies
5.2 Isotropic Material
6. Finite Element Method using Isoparametric Element
5.1 Basic theory of FEM
5.2 Practice using FEM program

1. Introduction
2. Tensor Analysis in Cartesian Coordinates
2.1 Summation Convention
2.2 Translation of coordinate
2.3 Scalar, Vector and Tensor
2.4 Quotient Rule
3. Stresses and Equilibrium
3.1 Stress
3.2 Equilibrium of Stresses
3.3 Cauchy's Relation
3.4 Principal Stress and Stress Invariant
4. Strain-Displacement Relations in Two-Dimensional Bodies
4.1 Deflection
4.2 Strain
5. Constitutive Equations in Isotropic Elastic Materials
5.1 Stress-strain Relations of Linear Elastic Bodies
5.2 Isotropic Material

6. Finite Element Method using Isoparametric Element
5.1 Basic theory of FEM
5.2 Practice using FEM program

Self Preparation and Review

Related subjects

Notes for textbook

Notes for reference

Goals to be achieved

The primary purpose is to encourage students to gain the fundamental concept and to raise their potential abilities for advanced and practical applications in the future.

The primary purpose is to encourage students to gain the fundamental concept and to raise their potential abilities for advanced and practical applications in the future.

Evaluation of achievement

Report

Report

Examination

Details of examination

Other information

Professor Taiki Saito (D805), e-mail: tsaito@ace.tut.ac.jp (Room: D-805)

Professor Taiki Saito (D805), e-mail: tsaito@ace.tut.ac.jp (Room: D-805)

Reference URL

http://www.rc.ace.tut.ac.jp/saito/index-e.html

http://www.rc.ace.tut.ac.jp/saito/index-e.html

Office hours

Relations to attainment objectives of learning and education

Key words

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

Subject name[English]	Seismic Evaluation of Existing Buildings[Seismic Evaluation of Existing Buildings]				
Schedule number	M45630030	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	松井 智哉 MATSUI Tomoya				
Numbering					

Objectives of class

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

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

Contents of class

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

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

Self Preparation and Review

Related subjects

Notes for textbook

Standard for Seismic Evaluation of Existing Reinforced Concrete Buildings, 2001

Standard for Seismic Evaluation of Existing Reinforced Concrete Buildings, 2001

Notes for reference

Goals to be achieved

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

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

Evaluation of achievement

Report

Report

Examination

Details of examination

Other information

Room：D-807

E-mail：matsui@ace.tut.ac.jp

Room：D-807

E-mail：matsui@ace.tut.ac.jp

Reference URL

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

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

Office hours

Wednesday 14:00-17:00

Wednesday 14:00-17:00

Relations to attainment objectives of learning and education

Key words

(M45630090)Coastal Hydraulics[Coastal Hydraulics]

Subject name[English]	Coastal Hydraulics[Coastal Hydraulics]				
Schedule number	M45630090	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	加藤 茂 KATO Shigeru				
Numbering					

Objectives of class

To understand the basic concept of coastal engineering and the advanced knowledge of coastal process, design and protection including numerical calculation.

To understand the basic concept of coastal engineering and the advanced knowledge of coastal process, design and protection including numerical calculation.

Contents of class

・Introduction of Coastal Engineering
water waves, wave theories, tides and water levels, wave breaking, etc.
・Shore Processes
near-shore current, coastal material, beach property, sediment transport, etc.
・Coastal Design
design process, model classification, physical & numerical models, etc.
・Computation of Coastal Morphology
sediment transport rate, analytical computation, numerical solutions, etc.

・Introduction of Coastal Engineering
water waves, wave theories, tides and water levels, wave breaking, etc.
・Shore Processes
near-shore current, coastal material, beach property, sediment transport, etc.
・Coastal Design
design process, model classification, physical & numerical models, etc.
・Computation of Coastal Morphology
sediment transport rate, analytical computation, numerical solutions, etc.

Self Preparation and Review

Related subjects

Basic knowledge of coastal engineering is desirable.

Basic knowledge of coastal engineering is desirable.

Notes for textbook

No textbook is required for this class. Lecture handout is distributed.

(Reference)
"Water Wave Mechanics for Engineers and Scientists – Advanced Series on Ocean Engineering – Vol. 2" Robert G. Dean & Robert A.
Dalrymple (World Scientific)
"Introduction to Coastal Engineering and Management -- Advanced Series on OceanEngineering -- Volume 16" J. William Kamphuis (World Scientific)
"Basic Coastal Engineering " Robert M. Sorensen (Kluwer Academic Publishers)

No textbook is required for this class. Lecture handout is distributed.

(Reference)
"Water Wave Mechanics for Engineers and Scientists – Advanced Series on Ocean Engineering – Vol. 2" Robert G. Dean & Robert A.
Dalrymple (World Scientific)

“Introduction to Coastal Engineering and Management -- Advanced Series on OceanEngineering -- Volume 16” J. William Kamphuis (World Scientific) “Basic Coastal Engineering “ Robert M. Sorensen (Kluwer Academic Publishers)
Notes for reference
Goals to be achieved Understanding the concept and methodology for coastal engineering. Understanding the concept and methodology for coastal engineering.
Evaluation of achievement Reports & attendance Reports & attendance
Examination
Details of examination
Other information Room : D-812 E-mail : s-kato@ace.tut.ac.jp. Room : D-812 E-mail : s-kato@ace.tut.ac.jp.
Reference URL N/A N/A
Office hours Monday, 13:00-14:30 Monday, 13:00-14:30
Relations to attainment objectives of learning and education N/A N/A
Key words Sediment transport, Current, Waves, Shore protection and management Sediment transport, Current, Waves, Shore protection and management

(M45630150)Advanced Transportation and Traffic Engineering[Advanced Transportation and Traffic Engineering]

Subject name[English]	Advanced Transportation and Traffic Engineering[Advanced Transportation and Traffic Engineering]				
Schedule number	M45630150	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	廣畠 康裕 HIROBATA Yasuhiro				
Numbering					

Objectives of class

To gain advanced knowledge of theories and methods for transportation planning and traffic engineering measures especially in urban areas.

To gain advanced knowledge of theories and methods for transportation planning and traffic engineering measures especially in urban areas.

Contents of class

1.Characteristics of transportation systems/
2.Characteristics of transportation problems and policy issues/ 3.Transportation planning process and role of modeling/
4.Survey methods of travel demand and traffic flows/
5.Methods of travel demand analysis and modeling/
6.Methods of trffic flow analyses/
7.Methods of evaluating transportation plan and traffic measures/
8.Other topics : Traffic flow theory, value of travel time, and valuing external effects of transportation

1.Characteristics of transportation systems/
2.Characteristics of transportation problems and policy issues/ 3.Transportation planning process and role of modeling/
4.Survey methods of travel demand and traffic flows/
5.Methods of travel demand analysis and modeling/
6.Methods of trffic flow analyses/
7.Methods of evaluating transportation plan and traffic measures/
8.Other topics : Traffic flow theory, value of travel time, and valuing external effects of transportation

Self Preparation and Review

Related subjects

Advanced Regional Planning and Design I,II
Advanced Regional Planning and Design I,II

Notes for textbook

Texts and papers will be decided by the opening of the class.

Texts and papers will be decided by the opening of the class.

Notes for reference

Goals to be achieved

1.To understand the necessity nad significance of transportation planning
2.To understand the concept of transportation planning
3.To gain the theories and methods in transportation planning
1.To understand the necessity nad significance of transportation planning
2.To understand the concept of transportation planning
3.To gain the theories and methods in transportation planning

Evaluation of achievement

Home work assignments will be required. Final reports or examination will be imposed.

Home work assignments will be required. Final reports or examination will be imposed.

Examination

Details of examination

Other information

room(D-705),hirobata@ace.tut.ac.jp

room(D-705),hirobata@ace.tut.ac.jp

Reference URL

Hirobata: http://www.tr.ace.tut.ac.jp

Hirobata: http://www.tr.ace.tut.ac.jp

Office hours

Hirobata: Mon,16:25-17:30; Tue,12:30-13:30
Hirobata: Mon,16:25-17:30; Tue,12:30-13:30

Relations to attainment objectives of learning and education

Key words

planning process, social & economic evaluation method, forecasting models
planning process, social & economic evaluation method, forecasting models

(M45630190)Advanced Structural System Planning and Design I[Advanced Structural System Planning and Design I]

Subject name[English]	Advanced Structural System Planning and Design I[Advanced Structural System Planning and Design I]				
Schedule number	M45630190	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Fall term	**Day of the week,period**	Intensive	**Credit(s)**	2
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 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

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Notes for reference

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

(M45630210)Advanced Environmental System Planning and Design I[Advanced Environmental System Planning and Design I]

Subject name[English]	Advanced Environmental System Planning and Design I[Advanced Environmental System Planning and Design I]				
Schedule number	M45630210	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Fall term	**Day of the week,period**	Intensive	**Credit(s)**	2
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 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

Notes for textbook

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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

(M45630230)Advanced Regional System Planning and Design I[Advanced Regional System Planning and Design I]

Subject name[English]	Advanced Regional System Planning and Design I[Advanced Regional System Planning and Design I]				
Schedule number	M45630230	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Fall term	**Day of the week,period**	Intensive	**Credit(s)**	2
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 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

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Details of examination

Other information

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

(M45630290)Seismic Design of Structures[Seismic Design of Structures]

Subject name[English]	Seismic Design of Structures[Seismic Design of Structures]				
Schedule number	M45630290	**Subject area**	Advanced Architecture and Civil Engineering	**Required or elective**	Elective
Time of starting a course	Fall 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				**Beggining grade**	
Charge teacher name[Roman alphabet mark]	齊藤　大樹 SAITOH Taiki				
Numbering					

Objectives of class

The objective of this class is to learn the evaluation method of structural performance of the building based on dynamic behavior and ultimate strength and deformation capacity.

The objective of this class is to learn the evaluation method of structural performance of the building based on dynamic behavior and ultimate strength and deformation capacity.

Contents of class

1. Basic concept of seismic design of building
2. Force-deformation characteristics of building materials
3. Seismic evaluation method for existing buildings
3-1. Screening method 1
3-2. Screening method 2
4. Post-seismic quick risk assessment of damaged building

1. Basic concept of seismic design of building
2. Force-deformation characteristics of building materials
3. Seismic evaluation method for existing buildings
3-1. Screening method 1
3-2. Screening method 2
4. Post-seismic quick risk assessment of damaged building

Self Preparation and Review

Related subjects

None

None

Notes for textbook

Notes for reference

Goals to be achieved

To understand structural design through learning the seismic evaluation method of structural member and building.

To understand structural design through learning the seismic evaluation method of structural member and building.

Evaluation of achievement

Report

Report

Examination

Details of examination

Other information

Professor Taiki Saito (D805), e-mail: tsaito@ace.tut.ac.jp (Room: D-805)

Professor Taiki Saito (D805), e-mail: tsaito@ace.tut.ac.jp (Room: D-805)

Reference URL

http://www.rc.ace.tut.ac.jp/saito/index-e.html

http://www.rc.ace.tut.ac.jp/saito/index-e.html
Office hours
Relations to attainment objectives of learning and education
Key words