

Syllabus

**International Master' s Degree
Program
(2016-Fall Term)**

(M40030030)Culture and Communication I[Culture and Communication I]

Subject name[English]	Culture and Communication I[Culture and Communication I]				
Schedule number	M40030030	Subject area	General courses	Required or elective	Elective
Time of starting a course	Fall term	Day of the week,period	Thu.1~1	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~2
Department Offered	Common			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	毛利 雅子 MOURI Masako				
Numbering					
Objectives of class					
Class objectives are					
1. to understand the basic relationship between language & communication					
2. to understand and to gain required elements for better communication					
Contents of class					
1. Introduction, Why we study language and communication					
2. Language & Communication					
3. Language & Intercultural Communication					
4. Language & Intercultural Communication					
5. Language & Identity in Intercultural Communication					
6. Culture, Communication & Intercultural Relationships					
7. Culture, Communication & Intercultural Relationships					
8. Language & Intercultural Communication in the Global Workplace					
9. Language & Intercultural Communication in the Global Workplace					
10. Culture & Nonverbal Communication					
11. Ethnocentricism and Others					
12. Final Individual Presentation					
13. Final Individual Presentation					
14. Final Individual Presentation					
15. Review					
Self Preparation and Review					
Assignment reading is required.					
Participation is crucial.					
Related subjects					
Notes for textbook					
All materials are provided. No textbook.					
Notes for reference					
Goals to be achieved					
1. To understand basic relationship between language & communication and to make comments					
2. To understand relationships among language, culture and communication with acquisition required elements for better communication					
Evaluation of achievement					
Evaluation					
Final presenation (40%), Final report (40%) Class participation (30%)					
Grade					
A:80% or above, B:79-65%, C:64-55%, D:Under 55					
Examination					
その他					
By Report					
Details of examination					
Other information					
Reference URL					
Office hours					
Make appointment in advance by mail or in class.					

Relations to attainment objectives of learning and education

Key words

(M40030090)Principles of Japanese Grammar[Principles of Japanese Grammar]

Subject name[English]	Principles of Japanese Grammar[Principles of Japanese Grammar]				
Schedule number	M40030090	Subject area	General courses	Required or elective	Elective
Time of starting a course	Fall term	Day of the week,period	Thu.1~1	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~2
Department Offered	Common			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	吉村 弓子 YOSHIMURA Yumiko				
Numbering					
Objectives of class					
This course aims to provide an opportunity to understand an overview of elementary Japanese grammar for the very beginners. In order to concentrate on grammar, students will not learn Japanese letters and conversation. The course will be taught in English.					
Contents of class					
01 (10/06) Introduction to the course and general features of Japanese					
02 (10/13) Pronunciation, Lesson 1: Copula, Particle "wa" [topic], and Declarative, negative, and interrogative sentence					
03 (10/20) Lesson 2 and 3: Demonstratives and Particle "no" [possession]					
04 (10/27) Lesson 4 and 5: Verbs, Tense (non-past and past), Particle "ni" [time], "kara [start], "made" [goal], "e" [direction], "de" [transportation], and "to" [cooperation]					
05 (11/10) Lesson 6 and 7; Particle "o" [object], "de" [place][means], "ni" [goal][source]					
06 (11/17) Lesson 8: Adjectives, Lesson 9: Particle "ga"[object]					
07 (11/24) Lesson 10: Existence, Lesson 11: Numerals and Counter suffixes					
08 (12/08) Lesson 12: Past tense of adjectives, Lesson 13: Adjectives of Desire					
09 (12/15) Lesson 14 and 15: Verb groups, "te"-form of verbs, and Sentences using "te"-form					
10 (01/12) Lesson 16: Sentences using "te"-form, Lesson 17: "nai"-form of verbs					
11 (01/19) Lesson 18: Dictionary form of verbs, Lesson 19: "ta"-form of verbs					
12 (01/26) Lesson 20: Polite and plain style, Lesson 21: Indirect speech					
13 (02/02) Lesson 22: Noun modification					
14 (02/09) Lesson 23: Complex sentence using "toki", Lesson 25: Subjunctive mood					
15 (02/16) Lesson 24: Exchanging things or kindness					
16 (03/02) Final exam					
Self Preparation and Review					
Read the respective parts of the textbook in advance. Memorize the sentences learned in every class meeting to prepare for the next class's quiz.					

Related subjects

Non-credit course "Basic Japanese" will cover the main textbook:

In the class "Basic Grammar" of the course, students will learn Exercise A and B.

In the class "Basic Conversation" of the course, students will be taught Exercise C and Conversation.

For more information, contact International Affairs Division.

Textbook1	Book title	Minna no Nihongo (Elementary Japanese I, 2nd Edition) Translation & Grammar Notes-English, Romanized Version	ISBN	978-4-88319-629-6
	Author		Publisher	3A Corporation
			Publish year	2013

Notes for textbook

Each lesson consists of 1)vocabulary, 2)translation of the main textbook, 3)useful words and information, and 4)grammar notes.

1)Vocabulary and 4)grammar notes only will be taught in the course.

Notes for reference**Goals to be achieved**

At the end of this course students will be able

- 1) to know pronunciation of Japanese language.
- 2) to understand pronunciation and meaning of elementary Japanese vocabulary.
- 3) to grasp an overview of elementary Japanese grammar.

Evaluation of achievement

Grading Policy: Quizzes 30%, Final exam 70%

A: The total score is 80 or more.

B: The total score is between 65 and 79.99.

C: The total score is between 55 and 64.99.

Examination

Examination(Face to Face)

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

Office Hour

Friday 11:00-12:00

By appointment 08:30-12:00, 13:30-16:30 on weekday will be available.

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

elementary Japanese, grammar

(M40110010)Ethics of Researcher[Ethics of Researcher]

Subject name[English]	Ethics of Researcher[Ethics of Researcher]				
Schedule number	M40110010	Subject area	General courses	Required or elective	Required
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	1~1
Department Offered	Common			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	教務委員会副委員長, 原 邦彦, 上野 未貴 kyoumu iinkai fukuiintyou, HARA Kunihiko, UENO Miki				
Numbering					
Objectives of class					
Assist graduate students as they undertake research activities and promote an understanding of the inherent ethical problems; lead students to think independently and exercise normative consciousness of research ethics through ethics education in research in accordance with goals of scientific education and research and characteristics of individual research specialties.					
Contents of class					
1st week: Introduction, 1st module in e-learning 2nd – 6th week: 2nd – 7th modules in e-learning – 7th week: Discussion with supervisor 8th week: Examination e-learning 1st module: Research Misconduct 2nd module: Ethical Issues in the Management of Data in Engineering Research 3rd module: Responsible Authorship 4th module: Ethical Issues in the Peer Review and Publication of Engineering Research 5th module: Collaborative Research in Engineering Fields 6th module: Whistleblowing and the Obligation to Protect the Public 7th module: Managing Public Research Funds					
Self Preparation and Review					
Students will need to refer to their textbook to prepare for and review each lesson.					
Related subjects					
Philosophy of Science and Technology, Ethics for Engineers					
Notes for textbook					
Notes for reference					
For the Sound Development of Science ?The Attitude of a Conscientious Scientist Japan Society for the Promotion of Science Editing Committee , MARUZEN PUBLISHING 2015 ISBN978-4-621-08938-5 (PDF : https://www.jsps.go.jp/j-kousei/data/rinri.pdf)					
Goals to be achieved					
To prevent misconduct and promote fair research activities, this course provides knowledge and techniques regarding research ethics in accordance with characteristics of each graduate student's research specialties.					
Evaluation of achievement					
[Evaluation method] Final exam(100%) [Evaluation basis] Those who take and pass the short test after each unit of e-learning contents will be evaluated with following basis. A: Achieved all goals and obtained 80 points or higher (out of 100) as total score of exams B: Achieved most goals and obtained 65 points or higher (out of 100) as total score of exams C: Achieved more than half of specified goals and obtained 55 points or higher (out of 100) as total score of exams					
Examination					
Examination(Face to Face)					
Details of examination					
Other information					

Reference URL

Office hours

Relations to attainment objectives of learning and education

Key words

Research Ethics, Conflict of Interest, Legal Compliance, Research Misconduct, Confidentiality Obligation, Security Export Control Policy, Copyright, Professionalism

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

Subject name[English]	Seminar on Mechanical Engineering I[Seminar on Mechanical Engineering I]				
Schedule number	M41610010	Subject area	Advanced Mechanical Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	4
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS51015				
Objectives of class	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.				
Self Preparation and Review					
Related subjects					
Notes for textbook	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.				
Evaluation of achievement	Coursework, presentation and/or report.				
Examination	None during exam period				
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			Begging grade	M2
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering	MEC_MAS61015				
Objectives of class	The seminar aims to provide a broad understanding of the mechanical engineering available for the master thesis research of a student.				
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.				
Self Preparation and Review					
Related subjects					
Notes for textbook	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.				
Evaluation of achievement	Coursework, presentation and/or report.				
Examination	None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

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

(M41610050)Internship[Internship]

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

(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	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	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.				
Self Preparation and Review					
Related subjects					
Notes for textbook	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.				
Evaluation of achievement	Coursework, presentation and/or report.				
Examination	None during exam period				
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	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	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.				
Self Preparation and Review					
Related subjects					
Notes for textbook	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.				
Evaluation of achievement	Coursework, presentation and/or report.				
Examination	None during exam period				
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	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	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.				
Self Preparation and Review					
Related subjects					
Notes for textbook	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.				
Evaluation of achievement	Coursework, presentation and/or report.				
Examination	None during exam period				
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	Mechanical Engineering			Begging grade	M1, M2
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.				
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.				
Self Preparation and Review					
Related subjects					
Notes for textbook	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.				
Evaluation of achievement	Coursework, presentation and/or report.				
Examination	None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(M41630290)Advanced Aeroacoustics[Advanced Aeroacoustics]

Subject name[English]	Advanced Aeroacoustics[Advanced Aeroacoustics]				
Schedule number	M41630290	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Fall1 term	Day of the week,period	Tue.2~2	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	飯田 明由 IIDA Akiyoshi				
Numbering					
Objectives of class					
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
Examination					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(M41630330)Advances in Mechanical Design[Advances in Mechanical Design]

Subject name[English]	Advances in Mechanical Design[Advances in Mechanical Design]				
Schedule number	M41630330	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Year	Day of the week,period	Tue.1~1	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	2~2
Department Offered	Mechanical Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	森 謙一郎, 足立 忠晴 MORI Ken-Ichiro, ADACHI Tadaharu				
Numbering	MEC_MAS53025				
Objectives of class					
This class is separated into two parts:					
Prof. Mori					
With the recent development of computers, numerical methods tend to be used in the field of manufacturing processes. The finite element method is mainly explained in this lecture. The finite element method is widely applied to engineering problems such as solid mechanics, fluid mechanics, etc.					
Prof. Adachi					
To understand mechanical performances of structures, and mechanical behaviors of solid and structures, fundamental mechanics of solid and structure is lectured. Especially, mechanics of thin-walled structures which is useful for practical design of mechanical structures is explained in detail.					
Contents of class					
Prof. Mori					
1st week: Numerical Methods: finite difference method, finite element method and boundary element method					
2nd week: Finite difference method for heat conduction: discretization of differential equation governing heat conduction, calculation of temperature distribution					
3rd week: Basic equations in solid mechanics: three-dimensional stress and strain, equilibrium equations, constitutive equations in elasticity and plasticity, yield criteria, incompressibility condition, etc.					
4th week: Finite element method for elastic deformation: triangular elements, distributions of displacement and strain					
5th week: Equilibrium equations of nodal forces, stiffness matrix,					
6th week: Treatment of boundary conditions					
7th week: Plasticity, elastic-plastic finite element method					
8th week: Summary					
Prof. Adachi					
Chapter 1. Introduction					
Chapter 2. Automobile Structures from View of Solid Mechanics					
Purpose of automobile structure, Loading to automobile structure					
Deformation of automobile structure, Performance of automobile structure					
Chapter 3. Fundamentals of Structural Mechanics					
Fundamental equations in solid mechanics					
Chapter 4. Forces and Moments Applying to Structures					
Normal force, shear force, bending moment, torsional moment					
Chapter 5. Elementary Mechanics of Structures					
Torsion and bending of thin-walled beams					
Chapter 6. Mechanics of Thin-Walled Structures					
Torsion and bending of thin-walled beams					
Chapter 7. Fundamentals of Dynamic Measurement					
Frequency response, Strain gage, Load cell, Accelerator					
Chapter 8. Summary					
Self Preparation and Review					
Related subjects					

Mechanics of Materials, Elasticity, Solid Mechanics
<p>Notes for textbook</p> <p>Part 1 (Prof. Mori): handout</p> <p>Text for Part (2) (Prof. Adachi) will be distributed on the web site. The details of the text will be given in the first class.</p>
<p>Notes for reference</p>
<p>Goals to be achieved</p> <p>Part (1) (Prof. Mori)</p> <p>To understand the finite element method</p> <p>Part (2) (Prof. Adachi)</p> <p>To understand physical meaning fundamental equations in solid mechanics.</p> <p>To deeply understand elementary mechanics of materials (strength of materials); tension of bar, torsion of axis and bending of beam.</p> <p>To understand mechanics of thin-walled structures.</p> <p>To know concept of dynamic measurement of deformation.</p>
<p>Evaluation of achievement</p> <p>Part 1 (Prof. Mori): Reports of every week</p> <p>Part 2 (Prof. Adachi): Examinations, 80 % and attendances, 20 %</p>
<p>Examination</p> <p>その他</p> <p>By Report</p>
<p>Details of examination</p>
<p>Other information</p> <p>Prof. Mori: room number: D-606, extension number: 6707</p> <p>Prof. Adachi: Room D-305, Extension phone 6664, Email adachi@me.tut.ac.jp</p>
<p>Reference URL</p> <p>Part(2) (Prof Adachi) http://solid.me.tut.ac.jp/solid/</p>
<p>Office hours</p> <p>Anytime. Contact me by email before coming if possible.</p>
<p>Relations to attainment objectives of learning and education</p>
<p>Key words</p> <p>Strength of materials, Mechanics of materials, solid mechanics, Structural mechanics, Thin-walled Structure, Numerical methods, Forming processes</p>

(M41630350)Advances in Thermal and Fluid Mechanics[Advances in Thermal and Fluid Mechanics]

Subject name[English]	Advances in Thermal and Fluid Mechanics[Advances in Thermal and Fluid Mechanics]				
Schedule number	M41630350	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Year	Day of the week,period	Tue.2~2	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	2~2
Department Offered	Mechanical Engineering			Begging grade	M2
Charge teacher name[Roman alphabet mark]	飯田 明由, 伊崎 昌伸 IIDA Akiyoshi, IZAKI Masanobu				
Numbering	MEC_MAS56025				
Objectives of class To understand fundamental thermodynamics and solid state physics of thin film and the applications					
Contents of class 1. Introduction to Thin film and preparation 2. Thermodynamics in solution chemical process(I) 3. Thermodynamics in solution chemical process(II) 4. Electronic state in inorganic thin films 5. Crystal structure and symmetry on thin films 6. Structural analysis of thin films 7. Physical properties of thin films 8. Oxide semiconductor thin films and application					
Self Preparation and Review This class deals with the deposition mechanism based on the thermodynamics and the characteristics of structure, optical and electrical properties based on solid state physics.					
Related subjects Basic knowledge of chemistry and solid-state physics					
Notes for textbook					
Reference1	Book title	Modern Electroplating, 5 th edition		ISBN	978-0-16778-6
	Author	M. schlesinger, M. Paunovic	Publisher	Weily & Sons	Publish year 2010
Notes for reference					
Goals to be achieved 1. Understanding of thermodynamic in soft-solution processing 2. Understanding of the basic solid state physics of thin films					
Evaluation of achievement Reports(50%) and presentation(50%)					
Examination By Report					
Details of examination					
Other information Masanobu Izaki, D-505, m-izaki@me.tut.ac.jp					
Reference URL					
Office hours as-needed					
Relations to attainment objectives of learning and education					

Key words

thin films, thermodynamics, physics, semiconductor

(M41630380)Robotics[Robotics]

Subject name[English]	Robotics[Robotics]				
Schedule number	M41630380	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Fall term	Day of the week,period	Fri.2~2	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	2~2
Department Offered	Mechanical Engineering			Begging grade	M2
Charge teacher name[Roman alphabet mark]	内山 直樹 UCHIYAMA Naoki				
Numbering					
Objectives of class					
Provides fundamentals of robotics, i.e., kinematics, dynamics and motion control of multiple rigid-bodies connected in series with revolute or prismatic joints.					
Contents of class					
1. Representation and transformation of positions and orientations in 3-D space 1-1. Description of positions and orientations in 3-D space. 1-2. Transformation of positions and orientations of rigid-objects. 1-3. Properties of transformation matrix. 2. Kinematics 2-1. Description of relative positions and orientations of manipulator links. 2-2. Transformation of manipulator positions and orientations. 2-3. Inverse kinematics. 3. Velocities and static forces 3-1. Linear and rotational velocities of rigid-objects. 3-2. Velocities of manipulator links. 3-3. Static forces in manipulators. 4. Dynamics 4-1. Review of rigid-body dynamics. 4-2. Newton-Euler and Lagrangian formulations of manipulator dynamics. 5. Control 5-1. Linear control. 5-2. Nonlinear control.					
Self Preparation and Review					
Read the handouts before the lecture.					
Related subjects					
Fundamentals of linear algebra, mechanics and control theory.					
Notes for textbook					
Handouts will be prepared.					
Reference1	Book title	Introduction to Robotics: Mechanics and Control, 3rd Edition		ISBN	
	Author	J. J. Craig	Publisher	Prentice Hall	Publish year 2005
Reference2	Book title	Robot Modeling and Control		ISBN	
	Author	M. W. Spong, S. Hutchinson, M. Vidyasagar	Publisher	John Wiley & Sons	Publish year 2006
Notes for reference					
Goals to be achieved					
Be able to derive kinematics and dynamics of robotic manipulators. Be able to design motion controllers for robotic manipulators.					
Evaluation of achievement					
Grade will be determined only from the end-of-term exam score.					
Examination					

Examination(Face to Face)

Details of examination

Other information

Office: Room D-406, E-mail uchiyama@tut.jp

Reference URL

Office hours

Contact the lecturer by e-mail first.

Relations to attainment objectives of learning and education

Key words

(M41630400)Robot Kinematics[Robot Kinematics]

Subject name[English]	Robot Kinematics[Robot Kinematics]				
Schedule number	M41630400	Subject area	Advanced Mechanical Engineering	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~
Department Offered	Mechanical Engineering			Begging grade	M1
Charge teacher name[Roman alphabet mark]	内山 直樹 UCHIYAMA Naoki				
Numbering					
Objectives of class					
Provides fundamental kinematics of robotic manipulators (multiple rigid-bodies connected in series with revolute or prismatic joints).					
Contents of class					
1. Representation and transformation of positions and orientations in 3-D space 1-1. Description of positions and orientations in 3-D space. 1-2. Transformation of positions and orientations of rigid-objects. 1-3. Properties of transformation matrix. 2. Kinematics 2-1. Description of relative positions and orientations of manipulator links. 2-2. Transformation of manipulator positions and orientations. 2-3. Inverse kinematics. 3. Velocities and static forces 3-1. Linear and rotational velocities of rigid-objects. 3-2. Velocities of manipulator links. 3-3. Static forces in manipulators.					
Self Preparation and Review					
Read the handouts before the lecture.					
Related subjects					
Fundamentals of linear algebra and mechanics.					
Notes for textbook					
Handouts will be prepared.					
Reference1	Book title	Introduction to Robotics: Mechanics and Control, 3rd Edition		ISBN	
	Author	J. J. Craig	Publisher	Prentice Hall	Publish year 2005
Reference2	Book title	Robot Modeling and Control		ISBN	
	Author	M. W. Spong, S. Hutchinson, M. Vidyasagar	Publisher	John Wiley & Sons	Publish year 2006
Notes for reference					
Goals to be achieved					
Be able to derive kinematics of robotic manipulators.					
Evaluation of achievement					
Grade will be determined only from the end-of-term exam score.					
Examination					
Examination(Face to Face)					
Details of examination					
Other information					

Office: Room D-406, E-mail uchiyama@tut.jp

Reference URL

Office hours

Contact the lecturer by e-mail first.

Relations to attainment objectives of learning and education

Key words

(M41630410)Computational Mechanics[Computational Mechanics]

Subject name[English]	Computational Mechanics[Computational Mechanics]				
Schedule number	M41630410	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Fall1 term	Day of the week,period	Tue.1~1	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	M1
Charge teacher name[Roman alphabet mark]	森 謙一郎 MORI Ken-Ichiro				
Numbering					
Objectives of class	With the recent development of computers, numerical methods tend to be used in the field of manufacturing processes. The finite element method is mainly explained in this lecture. The finite element method is widely applied to engineering problems such as solid mechanics, fluid mechanics, etc.				
Contents of class	1st week: Numerical Methods: finite difference method, finite element method and boundary element method 2nd week: Finite difference method for heat conduction: discretization of differential equation governing heat conduction, calculation of temperature distribution 3rd week: Basic equations in solid mechanics: three-dimensional stress and strain, equilibrium equations, constitutive equations in elasticity and plasticity, yield criteria, incompressibility condition, etc. 4th week: Finite element method for elastic deformation: triangular elements, distributions of displacement and strain 5th week: Equilibrium equations of nodal forces, stiffness matrix, 6th week: Treatment of boundary conditions 7th week: Plasticity, elastic-plastic finite element method 8th week: Summary				
Self Preparation and Review	solid mechanics				
Related subjects	Strength of material, Solid mechanics, Numerical methods				
Notes for textbook	Handout				
Notes for reference					
Goals to be achieved	To understand the finite element method				
Evaluation of achievement	Reports of every week				
Examination	その他 By Report				
Details of examination	solid mechanics, calculation using finite element method, numerical methods, etc.				
Other information	room number: D-606 extension number: 6707				
Reference URL	http://plast.me.tut.ac.jp/index.eng.html				
Office hours	Tuesday				
Relations to attainment objectives of learning and education	(D) 広範囲の知識を有機的に連携させた研究開発方法論の体得				

広範囲の知識の連携による研究開発に係る方法論を体得し、研究開発の設計立案と実践能力
To understand the numerical analysis in solid mechanics

Key words

forming processes, solid mechanics, finite element method

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

Subject name[English]	Thesis Research on Electrical and Electronic Information Engineering[Thesis Research on Electrical and Electronic Information Engineering]				
Schedule number	M42610020	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S2系教務委員, 2系各教員 2kei kyomu Iin-S, 2kei kakukyoin				
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.					
Contents of class					
The research subject depends on the supervisor and the research group you belong to. Every student will have an individual research subject. For more details, please contact with your supervisor.					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Reference and material will be available from the supervisor.					
Notes for reference					
Goals to be achieved					
To get something new on individual research fields. To develop his/her research skill including the planning and the presentation.					
Evaluation of achievement					
Presentation, Thesis, Coursework, and Outcomes are evaluated generally.					
Examination					
その他 None during exam period					
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	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.					
Contents of class					
The research subject depends on the supervisor and the research group you belong to. Every student will have an individual research subject. For more details, please contact with your supervisor.					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Reference and material will be available from the supervisor.					
Notes for reference					
Goals to be achieved					
To get something new on individual research fields. To develop his/her research skill including the planning and the presentation.					
Evaluation of achievement					
Presentation, Thesis, Coursework, and Outcomes are evaluated generally.					
Examination					
None during exam period					
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	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.					
Contents of class					
The research subject depends on the supervisor and the research group you belong to. Every student will have an individual research subject. For more details, please contact with your supervisor.					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Reference and material will be available from the supervisor.					
Notes for reference					
Goals to be achieved					
To get something new on individual research fields. To develop his/her research skill including the planning and the presentation.					
Evaluation of achievement					
Presentation, Thesis, Coursework, and Outcomes are evaluated generally.					
Examination					
None during exam period					
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	2~2
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
Numbering					
Objectives of class					
The seminar aims to provide a broad understanding of theoretical and experimental approaches related to the electrical and electronic information engineering for the research work of his/her master thesis.					
Contents of class					
The class provides both of fundamental knowledge on the research work of master thesis and the most advanced results in the related field by reading research papers and monographs. Contents of the class depend on the supervisor. To be announced by individual supervisors.					
Self Preparation and Review					
Related subjects					
Notes for textbook					
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.					
Evaluation of achievement					
Coursework, presentation and/or report.					
Examination					
None during exam period					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Seminar on Electrical and Electronic Information Engineering 1A[Seminar on Electrical and Electronic Information Engineering 1A]				
Schedule number	M42610050	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	4
Faculty	Graduate Program for Master's Degree			Subject grade	1~2
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 seminar aims to provide a broad understanding of theoretical and experimental approaches related to the electrical and electronic information engineering for the research work of his/her master thesis.					
Contents of class					
The class provides both of fundamental knowledge on the research work of master thesis and the most advanced results in the related field by reading research papers and monographs. Contents of the class depend on the supervisor. To be announced by individual supervisors.					
Self Preparation and Review					
Related subjects					
Notes for textbook					
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.					
Evaluation of achievement					
Coursework, presentation and/or report.					
Examination					
None during exam period					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Seminar on Electrical and Electronic Information Engineering 1B[Seminar on Electrical and Electronic Information Engineering 1B]				
Schedule number	M42610060	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	2~2
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
Numbering					
Objectives of class					
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
Examination					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(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	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 class aims to provide a basic understanding of R&D methodology related to the electrical and electronic information engineering for the research work of his/her master thesis.				
Contents of class	The class provides some fundamental tips to conduct R&D work effectively. Contents of the class depend on the supervisor. To be announced by individual supervisors				
Self Preparation and Review					
Related subjects					
Notes for textbook	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.				
Evaluation of achievement	Coursework and presentation are evaluated generally.				
Examination	None during exam period				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(M42630120)Material Science for Electronics 1[Material Science for Electronics 1]

Subject name[English]	Material Science for Electronics 1[Material Science for Electronics 1]				
Schedule number	M42630120	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	Electrical and Electronic Information Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	福田 光男, 中村 雄一, 武藤 浩行, 内田 裕久 FUKUDA Mitsuo, NAKAMURA Yuichi, MUTO Hiroyuki, UCHIDA Hironaga				
Numbering					
Objectives of class	Objective of this subject is to learn about the forefront research and development on thermoelectronics and photonics in electronic materials, and and powder processing.				
Contents of class	<p>1. Photonics. You will learn about photonic materials and devices. 1) photonic matreials and 2) (nano-) photonic devices.</p> <p>2. Spin electronics. You will learn about advanced magnetic materials and area from fundamentals to applications of magnetics. 1) Magnetic materials, 2) Applications of magnetics and magnetic materials, 3) Correlations between spins and various physical quantities, 4) Micro-magnetic devices and systems, 5) Spintronics and spin photonics.</p> <p>3. Powder processing technologies. You will learn about powder processing techniques for electronic devices. 1) sintering, 2) micrstructute of ceramics and 3) nano composite</p> <p>4. Thermoelectronics. You will learn about advanced thermoelectronic materials and area from fundamentals to applications of thermoelectronics. 1) thermoelectronic materials, 2) Applications and processing of thermoelectronic materials, 3) Thermoelectronic devices and systems.</p>				
Self Preparation and Review					
Related subjects					
Notes for textbook	Lecture materials will be distributed.				
Notes for reference					
Goals to be achieved	It aims at acquiring the broad knowledge of research and development by learning about the bases of recent research and development in various fields.				
Evaluation of achievement	The reports or tests will be set in each categories. The result is evaluated from the sum of those marks. Grades: A:80-100, B:65-79, C:55-64.				
Examination	Regular Class				
Details of examination					
Other information					
Reference URL					

Office hours

Please make an appointment via e-mail.

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

photonics, spin electronics, powder processing, thermelectronics

(M42630160)Electrical Energy Systems 1[Electrical Energy Systems 1]

Subject name[English]	Electrical Energy Systems 1[Electrical Energy Systems 1]				
Schedule number	M42630160	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	Electrical and Electronic Information Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	滝川 浩史, 櫻井 庸司, 穂積 直裕 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 three sub courses to choose from.					
Contents of class					
Sub Course 1					
1. Generation and control of discharge plasma					
2. Characteristics and diagnostics of discharge plasma					
3. Basic Plasma applications					
Sub Course 2					
1. Introduction to Electrochemical Energy Conversion Devices					
2. Lithium Secondary Batteries					
3. Fuel Cells					
Sub Course 3					
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					
Notes for textbook					
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.					
Evaluation of achievement					
Marks are based on the final examination or report (100%).					
Examination					
Examination(Face to Face)					
Details of examination					
Other information					
Office: C-311, TEL: 0532-44-6727, E-mail: takikawa@ee.tut.jp					
Reference URL					
Office hours					
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

(M42630200)Semiconductor Physics 1[Semiconductor Physics 1]

Subject name[English]	Semiconductor Physics 1[Semiconductor Physics 1]				
Schedule number	M42630200	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	Electrical and Electronic Information Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	若原 昭浩, 岡田 浩, 河野 剛士 WAKAHARA Akihiro, OKADA Hiroshi, KAWANO Takeshi				
Numbering					
Objectives of class					
To understand semiconductor physics, structure, design, and processing of advanced semiconductor devices.					
Contents of class					
This subject consists of two parts. The first half begins by introducing majority- and minority-carrier behavior in fundamental pn-junction and MOS structures. Injected minority carrier dynamics in semiconductors is also included. On the latter half, student choose one from following three topics.					
<ol style="list-style-type: none"> 1. Fabrication and characterization technology for Nanosturcture devices (Prof. Okada) 2. Band engineering and quantum effect devices (Prof. Wakahara) 3. Advanced MEMS/NEMS technologies(Prof. Kawano) 					
Adding to lectures by professors, in this subject, a case study is also conducted. Namely, students are required to give a presentation on researches on the given topics, and on design of devices that satisfies required specifications.					
Self Preparation and Review					
Related subjects					
Notes for textbook					
S.M.Sze, Physics of Semiconductor Devices (Wiley)					
Related references, data, printed matters will be given in the class.					
Notes for reference					
Goals to be achieved					
You will be able to:					
<ol style="list-style-type: none"> 1. Deeply understand fundamental phenomena in semiconductors, and explain operation principle of basic semiconductor devices to master course students. 2. Design a essential part of semiconductor devcie that satisfies the given specification. 3. Investigate on given topics, and give a lecture on this. 					
Evaluation of achievement					
Achievenemt of lectures of the case study, and writing research reports.					
Examination					
By Report					
Details of examination					
Other information					
Before choosing a sub-course, contact to following professors					

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

Reference URL

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

Office hours

Relations to attainment objectives of learning and education

Key words

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

(M42630260)Advanced Electronic Information System 1[Advanced Electronic Information System 1]

Subject name[English]	Advanced Electronic Information System 1[Advanced Electronic Information System 1]				
Schedule number	M42630260	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.1~1	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~2
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	市川 周一, 田村 昌也 ICHIKAWA Shuichi, TAMURA Masaya				
Numbering					
Objectives of class The aims of this lecture: (1) To understand various hardware algorithms for computer arithmetic, (2) To understand the role and design of microwave filter used in wireless communications.					
Contents of class This lecture consists of two themes shown below. (1) 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: Algorithms for multiplication Week 6,7: Algorithms for division Week 8: Examination (2) The aim of this course is to acquire the knowledge and design techniques of microwave filter used in wireless communications. 1. Introduction of microwave filter used in wireless communications 2. Image method and network synthesis method for filter design 3. Design of prototype filter and its Mapping 4. Inverter design 5. Resonator design 6. Coupled line design 7. Q factor and its evaluation 8. Examination					
Self Preparation and Review					
Related subjects Prerequisite (1): Fundamental knowledge and skills of logic design, algorithms, and computer structure. Prerequisite (2): Fundamental Knowledge and skills of high-frequency circuit and electromagnetic engineering					
Notes for textbook No textbooks are assigned.					
Notes for reference					

<p>Goals to be achieved</p> <p>(1) To understand various hardware algorithms for computer arithmetic. (2) To understand the role and design of microwave filter used in wireless communications.</p>
<p>Evaluation of achievement</p> <p>Item (1) 50%, Item (2) 50%.</p>
<p>Examination</p> <p>Examination(Face to Face)</p>
<p>Details of examination</p> <p>TBD</p>
<p>Other information</p> <p>(1) Shuichi Ichikawa, Room C-404, ext. 6897, E-mail: ichikawa@tut.jp (2) Masaya Tamura, Room C-405, ext. 6754, E-mail: tamura@ee.tut.ac.jp</p>
<p>Reference URL</p> <p>http://www.ccs.ee.tut.ac.jp/~ichikawa/lecture/ http://www.comm.ee.tut.ac.jp/em/index_en.html</p>
<p>Office hours</p> <p>Please make an appointment for consultation with the lecturer via e-mail or direct communication in classroom.</p>
<p>Relations to attainment objectives of learning and education</p>
<p>Key words</p> <p>(1) Logic design, computer arithmetic, hardware algorithm (2) Analog filter, microwave filter, high-frequency circuit design, distributed constant circuit, Electromagnetic Engineering</p>

(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	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S3系教務委員－23kei kyomu lin-S2				
Numbering					
Objectives of class	<p>The course is intended for students to study basic materials in depth, related to his/her research subjects in computer science and engineering.</p> <p>It is also aimed for students to acquire various skills, required in general research work, such as those for oral presentation, and technical discussion and writing.</p>				
Contents of class	While specific contents depend on the research areas students are involved in, it is usually the case for students to read relevant textbooks/research papers and report on them, as well as to present and discuss on the research work of their own.				
Self Preparation and Review	Consult with your advisor.				
Related subjects	Consult with your advisor.				
Notes for textbook	Consult with your advisor.				
Notes for reference					
Goals to be achieved	To acquire abilities for technical readings in English, logical thinking/explanation, and clear presentation.				
Evaluation of achievement	Will be evaluated by taking into account various factors overall, such as technical explanation, question answering, discussion involvements and so on.				
Examination	None during exam period				
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	Computer Science and Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S3系教務委員－23kei kyomu lin-S2				
Numbering					
Objectives of class	<p>The course is intended for students to study basic materials in depth, related to his/her research subjects in computer science and engineering.</p> <p>It is also aimed for students to acquire various skills, required in general research work, such as those for oral presentation, and technical discussion and writing.</p>				
Contents of class	While specific contents depend on the research areas students are involved in, it is usually the case for students to read relevant textbooks/research papers and report on them, as well as to present and discuss on the research work of their own.				
Self Preparation and Review	Consult with your advisor.				
Related subjects	Consult with your advisor.				
Notes for textbook	Consult with your advisor.				
Notes for reference					
Goals to be achieved	To acquire abilities for technical readings in English, logical thinking/explanation, and clear presentation.				
Evaluation of achievement	Will be evaluated by taking into account various factors overall, such as technical explanation, question answering, discussion involvements and so on.				
Examination	None during exam period				
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~
Department Offered	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, 3系各教員 3kei kyomu iin-S, 3kei kakukyoin				
Numbering					
Objectives of class	<p>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.</p> <p>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.</p>				
Contents of class	<p>It is usually the case that thesis research is carried out on individual bases with specific contents differing from one student to another.</p> <p>Consult with your advisor for any further details.</p>				
Self Preparation and Review	<p>Consult with your advisor for them.</p>				
Related subjects	<p>Consult with your advisor for them.</p>				
Notes for textbook	<p>Consult with your advisor for them.</p>				
Notes for reference					
Goals to be achieved	<p>To acquire abilities for doing research and development at technically high level, sophisticated decision making, and leading large scale research projects.</p>				
Evaluation of achievement	<p>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.</p>				
Examination	<p>その他 None during exam period</p>				
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	M2
Charge teacher name[Roman alphabet mark]	S3系教務委員, S3系教務委員—23kei kyomu lin-S, 3kei kyomu lin-S2				
Numbering					
Objectives of class	<p>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.</p> <p>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.</p>				
Contents of class	<p>It is usually the case that thesis research is carried out on individual bases with specific contents differing from one student to another.</p> <p>Consult with your advisor for any further details.</p>				
Self Preparation and Review	<p>Consult with your advisor for them.</p>				
Related subjects	<p>Consult with your advisor for them.</p>				
Notes for textbook	<p>Consult with your advisor for them.</p>				
Notes for reference					
Goals to be achieved	<p>To acquire abilities for doing research and development at technically high level, sophisticated decision making, and leading large scale research projects.</p>				
Evaluation of achievement	<p>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.</p>				
Examination	<p>None during exam period</p>				
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	M2
Charge teacher name[Roman alphabet mark]	S3系教務委員－23kei kyomu lin-S2				
Numbering					
Objectives of class					
<p>The course is intended for students to study basic materials in depth, related to his/her research subjects in computer science and engineering.</p> <p>It is also aimed for students to acquire various skills, required in general research work, such as those for oral presentation, and technical discussion and writing.</p>					
Contents of class					
While specific contents depend on the research areas students are involved in, it is usually the case for students to read relevant textbooks/research papers and report on them, as well as to present and discuss on the research work of their own.					
Self Preparation and Review					
Related subjects					
Consult with your advisor.					
Notes for textbook					
Consult with your advisor.					
Notes for reference					
Goals to be achieved					
To acquire abilities for technical readings in English, logical thinking/explanation, and clear presentation.					
Evaluation of achievement					
Will be evaluated by taking into account various factors overall, such as technical explanation, question answering, discussion involvements and so on.					
Examination					
None during exam period					
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	M2
Charge teacher name[Roman alphabet mark]	S3系教務委員 3kei kyomu Iin-S				
Numbering					
Objectives of class	<p>The course is intended for students to study basic materials in depth, related to his/her research subjects in computer science and engineering.</p> <p>It is also aimed for students to acquire various skills, required in general research work, such as those for oral presentation, and technical discussion and writing.</p>				
Contents of class	While specific contents depend on the research areas students are involved in, it is usually the case for students to read relevant textbooks/research papers and report on them, as well as to present and discuss on the research work of their own.				
Self Preparation and Review	Consult with your advisor.				
Related subjects	Consult with your advisor.				
Notes for textbook	Consult with your advisor.				
Notes for reference					
Goals to be achieved	To acquire abilities for technical readings in English, logical thinking/explanation, and clear presentation.				
Evaluation of achievement	Will be evaluated by taking into account various factors overall, such as technical explanation, question answering, discussion involvements and so on.				
Examination	None during exam period				
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	Computer Science and Engineering			Beggining grade	M1, M2
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

[Kanazawa]

- 1: Introduction
- 2: Projective Geometry
- 3: Epipolar Geometry
- 4: 3-D Reconstruction from Two Views
- 5: Affine Projection
- 6: Uncalibrated Stereo
- 7: Structure from Motion
- 8: Experiments

[Sugaya]

- 9: Mathematical Introduction
- 10: Limits of Functions
- 11: Optimization of Functions
- 12: Least Squares
- 13: Advance of Least Squares
- 14: Non-linear Optimization
- 15: Maximum Likelihood

[Kanazawa]

- 1: Introduction
- 2: Projective Geometry
- 3: Epipolar Geometry
- 4: 3-D Reconstruction from Two Views
- 5: Affine Projection
- 6: Uncalibrated Stereo
- 7: Structure from Motion
- 8: Experiments

[Sugaya]

- 9: Mathematical Introduction
- 10: Limits of Functions
- 11: Optimization of Functions
- 12: Least Squares
- 13: Advance of Least Squares
- 14: Non-linear Optimization
- 15: Maximum Likelihood

Self Preparation and Review**Related subjects**

Geometry, Linear Algebra, Statistics.

Geometry, Linear Algebra, Statistics.

Notes for textbook

Handouts will be prepared.

Handouts will be prepared.

Reference1	Book title	Multiple View Geometry in Computer Vision			ISBN	
	Author	R.I. Hartley and A. Zisserman	Publisher	Cambridge University Press	Publish year	2000
Reference2	Book title	Computer Vision -- A Modern Approach --			ISBN	
	Author	D.A. Forsyth and J. Ponce	Publisher	Prentice Hall	Publish year	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,
- optimization

Understanding of the fundamentals and advanced issues on image processing and computer vision including:

- camera model,
- epipolar geometry,
- 3-D reconstruction from images,
- optimization

Evaluation of achievement

Grade will be determined by all submitted reports:

A: score ≥ 80

B: score ≥ 65

C: score ≥ 55

Grade will be determined by all submitted reports:

A: score ≥ 80

B: score ≥ 65

C: score ≥ 55

Examination

レポートで実施

By Report

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

(M43630140)Algorithm Engineering, Advanced[Algorithm Engineering, Advanced]

Subject name[English]	Algorithm Engineering, Advanced[Algorithm Engineering, Advanced]				
Schedule number	M43630140	Subject area	Advanced Computer Science and 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	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	増山 繁 MASUYAMA Shigeru				
Numbering					
Objectives of class	To learn knowledge and skill on advanced computer science and engineering.				
Contents of class	Lectures are given 15 times. Each time a student is requested to give a presentation on selected topics in Advanced computer science and engineering.				
Self Preparation and Review					
Related subjects					
Notes for textbook	No textbook is used.				
Notes for reference					
Goals to be achieved	Acquire knowledge on advanced computer science and engineering				
Evaluation of achievement	Presentation:50% assignment (report): 50%				
Examination	By Report				
Details of examination					
Other information	F503, masuyama@tut.jp				
Reference URL					
Office hours	Please make an appointment in advance by e-mail.				
Relations to attainment objectives of learning and education					
Key words	computer science				

(M43630200)Advanced Topics in Brain and Cognitive Sciences[Advanced Topics in Brain and Cognitive Sciences]

Subject name[English]	Advanced Topics in Brain and Cognitive Sciences[Advanced Topics in Brain and Cognitive Sciences]				
Schedule number	M43630200	Subject area	Advanced Computer Science and 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	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	北崎 充晃, 中内 茂樹 KITAZAKI Michiteru, NAKAUCHI Shigeki				
Numbering					
Objectives of class					
To understand brain and neural system functioning underlying the excellence of human information processing such as perception, learning, and memory. To learn methods of measurement based on engineering approaches and data analysis. To understand what is "human" based on deep insights gained from the study.					
Contents of class					
The current findings on the excellence of human information processing in perception, learning, and memory are explained and methodologies are introduced to investigate the brain using a new approach combining physiology and engineering to realize technological applications. The lectures include various demonstrations and discussions about the latest findings on neural activities and perceptual phenomena.					
Lecture Schedule					
1. Introduction					
1, 2. Physiological basics of vision					
3, 4. Visual illusions					
5, 6. Color perception					
7. Depth perception					
8, 9. Motion perception					
10, 11. Attention and Consciousness					
12. Computational vision					
13. Color-imaging technology					
14. Color Universal Design					
15. Development					
Self Preparation and Review					
Read the documents provided before each lecture. Review the lectures in consultation with the references and other resources such as the Internet.					
Related subjects					
Notes for textbook					
Documents (slides) will be provided via web before commencement of the lectures.					
Reference1	Book title	Cognitive Neuroscience; Fourth International Student edition		ISBN	978-0393922288
	Author	Michael S. Gazzaniga	Publisher	W. W. Norton & Company	Publish year 2008
Reference2	Book title	イラストレクチャー 認知神経科学		ISBN	978-4274208225
	Author	村上郁也 編著	Publisher	オーム社	Publish year 2010
Notes for reference					
Goals to be achieved					
To be able to explain the differences between traditional information processing and human information processing					
To be able to discuss research concepts based on cognitive neurosciences, which will replace current technologies					

To be able to discuss human-machine symbiosis

Evaluation of achievement

Grades will be based on theme reports from each lecture (60%) and the final report (40%)

A: 80 points or higher (out of 100)

B: 65 points or higher (out of 100)

C: 55 points or higher (out of 100)

Examination

By Report

Details of examination

Other information

Please contact Prof. Nakauchi (C-510, nakauchi@tut.jp) before attending the regular lectures.

Reference URL

Office hours

Contact by e-mail

Relations to attainment objectives of learning and education

Key words

cognitive neurosciences, color, perception

(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	Computer Science and Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	三浦 純 MIURA Jun				
Numbering					
Objectives of class					
Fundamental and advanced issues in intelligent robotics will be discussed. Topics included are probabilistic sensor fusion techniques (e.g., Kalman filter and particle filter) and its application to mobile robot localization and mapping.					
Contents of class					
Week 1: Introduction to scene recognition and sensor fusion. Week 2: Probability basic and Bayes filter. Week 3: Kalman filter and its extensions. Week 4: Nonparametric filters. Week 5: Mobile robot localization. Week 6: Mobile robot mapping. Week 7: SLAM (Simultaneous Localization and Mapping). Week 8: Presentations of students' reports and conclusions.					
Self Preparation and Review					
Related subjects					
Fundamental knowledge of linear algebra and probability theory is useful.					
Notes for textbook					
Handouts will be prepared. The main reference is shown below.					
Reference1	Book title	Probabilistic Robotics		ISBN	978-0262201629
	Author	S. Thrun, W. Burgard, D. Fox	Publisher	The MIT Press	Publish year 2005
Notes for reference					
Goals to be achieved					
Understanding of the fundamentals of sensor fusion strategies and algorithms.					
Evaluation of achievement					
Grade will be determined by final presentation and report.					
Examination					
By Report					
Details of examination					
Other information					
Room C-604, Ext. 6773, Email: jun.miura@tut.jp (Jun Miura)					
Reference URL					
http://www.aisl.cs.tut.ac.jp/classes/robotics-and-informatics/ ID and password will be given at the class.					

Office hours

Make an appointment beforehand by email.

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

Robotics

(M43630290)Web Data Engineering 2[Web Data Engineering 2]

Subject name[English]	Web Data Engineering 2[Web Data Engineering 2]				
Schedule number	M43630290	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Fall1 term	Day of the week,period	Mon.2~2	Credit(s)	1
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]	栗山 繁 KURIYAMA Shigeru				
Numbering					
Objectives of class					
<p>本講義では、大規模または多次元のデータを効率的かつ効果的に表示する可視化の設計手法を講述し、対象データの性質や特徴を分析しながら可視化機構を自らデザインしてプログラム化する制作実習によって、実践的な応用開発力を習得する。</p> <p>This class teaches design methodology of developing data exploration tools by efficiently and effectively visualizing huge size or dimension of dataset. Practical skill of developing visualization tools is learned by the practice of actual programming.</p>					
Contents of class					
<p>第1週目:情報可視化の導入と概要説明 第2週目:可視化 API とグラフ描画演習 第3週目:相関の可視化(多変量データ) 第4週目:構造の可視化(階層・木構造) 第5週目:関係の可視化(グラフ・ネットワーク) 第6週目:テキストと変動の可視化と対話的操作 第7+0.5週目:課題制作</p> <p>Week 1. Introduction and overview of information visualization Week 2. API for drawing diagram Week 3. Correlation visualization of multivariate data Week 4. Relation visualization with hierarchical and network representation Week 5. Visualization of relation (graph and network) Week 6. Visualization of textual information and time-variation Week 7+0.5. Exercise of developing a visualization tool</p>					
Self Preparation and Review					
<p>予習・復習のために、それまでに講義した内容と翌週の講義内容を Web でのe-ラーニングシステム(Moodle)で公開する。 All digital textbook are freely supplied on e-learning system developed on moodle.</p>					
Related subjects					
<p>数値解析, 多変量解析, データマイニング・可視化特論 I Numerical analysis, Multivariate analysis, Advanced Data Mining and Visualization 1</p>					
Notes for textbook					
<p>e-ラーニングシステム(Moodle)に公開する電子テキストを使用する。 Digital textbook is supplied on an E-learning system of moodle.</p>					
Notes for reference					
Goals to be achieved					
<p>大規模、多次元のデータを効率的かつ効果的に可視化するデザイン手法を理解し、与えられたデータの性質を考慮して最適な可視化のプログラムを制作できる技能を習得する</p> <p>The goal of this class is to teach design methodology of the visualization system for efficiently and effectively visualize huge size of multi-dimensional dataset.</p>					
Evaluation of achievement					
<p>中間レポート 20 点, 出席 20 点, および制作課題 60 点の合計 100 点で採点する。 A: 達成目標をすべて達成しており, かつ中間レポート, 出席, および制作課題の合計点(100 点満点)が 80 点以上 B: 達成目標を 80%達成しており, かつ中間レポート, 出席, および制作課題の合計点(100 点満点)が 65 点以上 C: 達成目標を 60%達成しており, かつ中間レポート, 出席, および制作課題の合計点(100 点満点)が 55 点以上 中間レポート 20 点, 出席 20 点, および制作課題 60 点の合計 100 点で採点する。</p>					

- A: 達成目標をすべて達成しており, かつ中間レポート, 出席, および制作課題の合計点(100点満点)が 80 点以上
B: 達成目標を 80%達成しており, かつ中間レポート, 出席, および制作課題の合計点(100点満点)が 65 点以上
C: 達成目標を 60%達成しており, かつ中間レポート, 出席, および制作課題の合計点(100点満点)が 55 点以上

Examination

その他

Other

Details of examination

制作課題の発表会を試験期間中に実施する。

Presentation of final exercise is carried out within the period of a regular exam.

Other information

Reference URL

Office hours

随時だが、電子メールで予約をとること。

Anytime, but requires reservation by E-mail.

Relations to attainment objectives of learning and education

(C) 理論的・応用的知識の獲得と発展的活用能力

重要な学術・技術分野の理論・応用知識を自発的に獲得し、発展的に活用できる能力

(E) 国内外において活躍できる表現力・コミュニケーション力

論文、口頭及び情報メディアを通じて、自分の論点や考えなどを国の内外において効果的に表現し、コミュニケーションする能力とプレゼンテーションする能力

Key words

情報検索、情報可視化、ビジュアル情報処理

Information visualization, Visual data mining, Visual information processing

(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	Computer Science and Engineering			Beggining grade	M1, M2
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.					
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					
Self Preparation and Review					
Related subjects					
Notes for textbook Handouts are distributed.					
Notes for reference					
Goals to be achieved					
- Know complex and intelligent mathematical models, and understand them at the degree which you can simulte them by your programming or by using simulation environment.					
- Can explain technical terms of complex and intelligent mathematical models.					
- Master numerical calculation methods that are used in complex and intelligent mathematical models.					

Evaluation of achievement

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

Examination

その他

Examination(Face to Face)

Details of examination**Other information**

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

Reference URL

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

Office hours

After this class

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	Thu.2~2	Credit(s)	1
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]	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.					
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					
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)					
Notes for reference					
Goals to be achieved					
Evaluation of achievement Class performance (50%) and term-end report (50%)					
Examination その他 By Report					
Details of examination					
Other information Room F-504, Ext. 6895					
Reference URL					
Office hours					

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

(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	M1, M2
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.				
Contents of class	The students will be required to read textbooks and papers written by other language than Japanese, especially English, which are suggested by his/her supervisor, and to report and discuss deeply on his/her research subject in the seminar.				
Self Preparation and Review					
Related subjects	Seminar on 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.				
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.				
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.				
Examination	None during exam period				
Details of examination					
Other information	Supervisor(s)				
Reference URL	http://ens.tut.ac.jp/en/				
Office hours	Students are encouraged visiting by appointment.				
Relations to attainment objectives of learning and education					
Key words	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	M2
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.					
Contents of class					
The students will be required to read textbooks and papers written by other language than Japanese, especially English, which are suggested by his/her supervisor, and to report and discuss deeply on his/her research subject in the seminar.					
Self Preparation and Review					
Related subjects					
Seminar on 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.					
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.					
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.					
Examination					
None during exam period					
Details of examination					
Other information					
Supervisor(s)					
Reference URL					
http://ens.tut.ac.jp/en/					
Office hours					
Students are encouraged visiting by appointment.					
Relations to attainment objectives of learning and education					
Key words					
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~
Department Offered	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu iin-S, 4kei kakuyouin				
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 lesson are to acquire the knowledge and experimental and analytical skills required for his/her research subject, to learn the scientific and social importance of his/her subject by researching for related studies by others, and to write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.					
Contents of class					
The students are required to have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be described as a Master's Thesis. The students must also present the results from his/her research, discuss, and answer the questions with the reviewers in the final master's dissertation defense.					
Self Preparation and Review					
Related subjects					
Seminar on 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.					
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					
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).					
Examination					
その他 None during exam period					
Details of examination					
Other information					
Supervisor					
Reference URL					
http://ens.tut.ac.jp/en/					
Office hours					
Students are encouraged visiting by appointment.					
Relations to attainment objectives of learning and education					

Key words

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	Environmental and Life Sciences			Beggining grade	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 lesson are to acquire the knowledge and experimental and analytical skills required for his/her research subject, to learn the scientific and social importance of his/her subject by researching for related studies by others, and to write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.				
Contents of class	The students are required to have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be described as a Master's Thesis. The students must also present the results from his/her research, discuss, and answer the questions with the reviewers in the final master's dissertation defense.				
Self Preparation and Review					
Related subjects	Seminar on 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.				
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				
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).				
Examination	None during exam period				
Details of examination					
Other information	Supervisor				
Reference URL	http://ens.tut.ac.jp/en/				
Office hours	Students are encouraged visiting by appointment.				
Relations to attainment objectives of learning and education					

Key words

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

(M44610033)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	M44610033	Subject area	Advanced Environmental and Life Sciences	Required or elective	Required
Time of starting a course	1.5Years	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	M2
Charge teacher name[Roman alphabet mark]	S4系教務委員, 4系各教員 4kei kyomu Iin-S, 4kei kakukyoin				
Numbering					
Objectives of class	☆保証科目のためシラバス入力不要				
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
Examination	その他				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(M44610033)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	M44610033	Subject area	Advanced Environmental and Life Sciences	Required or elective	Required
Time of starting a course	Fall term	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~2
Department Offered				Beggining grade	
Charge teacher name[Roman alphabet mark]	S4系教務委員 4kei kyomu Iin-S				
Numbering					
Objectives of class					
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
Examination					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(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	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 lesson are to acquire the knowledge and experimental and analytical skills required for his/her research subject, to learn the scientific and social importance of his/her subject by researching for related studies by others, and to write a Master's Thesis. The students will acquire the skills and capacities of presentation by discussing in the final review of his/her Master's Thesis.				
Contents of class	The students are required to have his/her research subject under the direction of his/her supervisor and perform his/her research by acquiring the experimental and analytical skills in the laboratory. The students will be expected to learn the scientific and social background of his/her research subject by collecting and reading the references relating to his/her research. The results from his/her research must be described as a Master's Thesis. The students must also present the results from his/her research, discuss, and answer the questions with the reviewers in the final master's dissertation defense.				
Self Preparation and Review					
Related subjects	Seminar on 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.				
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				
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).				
Examination	None during exam period				
Details of examination					
Other information	Supervisor(s)				
Reference URL	http://ens.tut.ac.jp/en/				
Office hours	Students are encouraged visiting by appointment.				
Relations to attainment objectives of learning and education					

Key words

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	M2
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 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 expected to read textbooks and papers written by foreign language that are indicated by his/her supervisor, and report and discuss deeply on his/her research subject in the seminar.				
Self Preparation and Review					
Related subjects	Thesis Research on Environmental and Life Science All other relevant subjects in Advanced Environmental and Life Sciences				
Notes for textbook	Supervisor will recommend textbooks and papers to students.				
Notes for reference					
Goals to be achieved	To acquire basic knowledge on 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 papers, discussions, reports and presentations of his/her research in the seminar. His/her supervisor evaluates the scores.				
Examination	None during exam period				
Details of examination					
Other information	Supervisor				
Reference URL	http://ens.tut.ac.jp/en/				
Office hours	Students are encouraged visiting by appointment.				
Relations to attainment objectives of learning and education					
Key words					

(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	Thu.3~3	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~2
Department Offered	Environmental and Life Sciences			Begging grade	M1, M2
Charge teacher name[Roman alphabet mark]	伊津野 真一, 原口 直樹 ITSUNO Shinichi, HARAGUCHI Naoki				
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.					
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) Electrophilic 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					
Notes for textbook					
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					
Evaluation of achievement					
The report on selected topics will be imposed.					
Examination					
By Report					
Details of examination					
Other information					
B-502 6813 itsuno@ens.tut.ac.jp					
B-403 6812					

haraguchi@ens.tut.ac.jp

Reference URL

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

Office hours

Any time

Relations to attainment objectives of learning and education

Key words

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

(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	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	田中 照通, 梅影 創 TANAKA Terumichi, UMEKAGE So				
Numbering					
Objectives of class					
<p>Aim: Students have to enlarge knowledge of biology, biochemistry, and molecular biology by reading good papers in this field. Papers of Nobel Prize Laureates are used in this Class, to learn both importance and impact of the work.</p> <p>Aim: Students have to enlarge knowledge of biology, biochemistry, and molecular biology by reading good papers in this field. Papers of Nobel Prize Laureates are used in this Class, to learn both importance and impact of the work.</p>					
Contents of class					
<p>Style: No Lecture. Students choose and read Nobel Prize Laureates' Papers, and Make a Presentation of the content.</p> <p>in 2016: Dr. Tanaka will control the Class.</p> <p>Before the presentation by the Students begins, Dr. Tanaka will have guidance of Biochemistry and Molecular Biology.</p> <p>Style: No Lecture. Students choose and read Nobel Prize Laureates' Papers, and Make a Presentation of the content.</p> <p>in 2016: Dr. Tanaka will control the Class.</p> <p>Before the presentation by the Students begins, Dr. Tanaka will have guidance of Biochemistry and Molecular Biology.</p>					
Self Preparation and Review					
<p>Process: (1) Visit the HP of "Nobel Prize" Organization. http://nobelprize.org/</p> <p>(2) Choose two "Nobel Prize Awards" in the List described below, (Limited from "Chemistry" and "Physiology or Medicine") and Get and Read carefully "original papers" of the Laureates. (the information of Original Paper(s) may appear in the HP or not. So you have to Find the Original Paper(s) which is/are strongly related with the Award.) *Note: You cannot choose the "Award" which was already chosen by other Student.</p> <p>(3) Send me e-mail(s) which "Awards" you have chosen. (by 30th, Oct., 2016) in the e-mail, you have to describe: (i) your name, (ii) your student ID, (iii) the name of Laboratory to which you belong, (iv) the year of each Award which you have chosen, (for two "Awards") (v) all name(s) of Laureates of the Award, and (vi) information of the Original papers of the Laureates (journal name, year, volume, pages, authors' name, and title)</p> <p>(4) Make a presentation to the Audience (Students and me) for each "Award".</p> <p>Process:</p>					

(1) Visit the HP of “Nobel Prize” Organization. <http://nobelprize.org/>

(2) Choose two “Nobel Prize Awards” in the List described below. (Limited from “Chemistry” and “Physiology or Medicine”) and Get and Read carefully “original papers” of the Laureates.

(the information of Original Paper(s) may appear in the HP or not.

So you have to Find the Original Paper(s) which is/are strongly related with the Award.)

*Note:

You cannot choose the “Award” which was already chosen by other Student.

(3) Send me e-mail(s) which “Awards” you have chosen. (by 30th, Oct., 2016)

in the e-mail, you have to describe:

(i) your name, (ii) your student ID,

(iii) the name of Laboratory to which you belong,

(iv) the year of each Award which you have chosen, (for two “Awards”)

(v) all name(s) of Laureates of the Award, and

(vi) information of the Original papers of the Laureates (journal name, year, volume, pages, authors’ name, and title)

(4) Make a presentation to the Audience (Students and me) for each “Award”.

Related subjects

Notes for textbook

Notes for reference

Goals to be achieved

Evaluation of achievement

For the Credit:

40 credits for each Presentation. (40x2=80)

You can get up to 20 credits by Good questions and comment to the Audience.

For the Credit:

40 credits for each Presentation. (40x2=80)

You can get up to 20 credits by Good questions and comment to the Audience.

Examination

試験期間中には何も行わない

None during exam period

Details of examination

Other information

Contact (e-mail): terumichi-tanaka@tut.jp

Contact (e-mail): terumichi-tanaka@tut.jp

Reference URL

Office hours

any time, but e-mail must be sent to me in advance.

any time, but e-mail must be sent to me in advance.

Relations to attainment objectives of learning and education

Key words

Nobel prize, presentation, molecular biology, biochemistry

Nobel prize, presentation, molecular biology, biochemistry

(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	Environmental and Life Sciences			Begging grade	M1, M2
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.				
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				
Self Preparation and Review					
Related subjects	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				
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.				
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).				
Examination	None during exam period				
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				
Reference URL					
Office hours	Please make an appointment.				
Relations to attainment objectives of learning and education					

Key words

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	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	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.				
Self Preparation and Review					
Related subjects	Advanced Life Science and Biotechnology II				
Notes for textbook	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.				
Evaluation of achievement	The evaluation is based on the scores of reports, presentations, and examination.				
Examination	None during exam period				
Details of examination					
Other information	Supervisor				
Reference URL					
Office hours	Students are encouraged visiting by appointment.				
Relations to attainment objectives of learning and education					
Key words	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	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	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.				
Self Preparation and Review					
Related subjects	Advanced Environmental Technology II				
Notes for textbook	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.				
Evaluation of achievement	The evaluation is based on the scores of reports, presentations, and examination.				
Examination	None during exam period				
Details of examination					
Other information	Supervisor				
Reference URL					
Office hours	Students are encouraged visiting by appointment.				
Relations to attainment objectives of learning and education					
Key words	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	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	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.				
Self Preparation and Review					
Related subjects					
Notes for textbook	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.				
Evaluation of achievement	The evaluation is based on the scores of reports, presentations, and examination.				
Examination	None during exam period				
Details of examination					
Other information	Supervisor				
Reference URL					
Office hours	Students are encouraged visiting by appointment.				
Relations to attainment objectives of learning and education					
Key words	Ecological systems, industrial ecology, environmental technology, materials flows				

(M44630310)Advanced Separation Chemistry[Advanced Separation Chemistry]

Subject name[English]	Advanced Separation Chemistry[Advanced Separation Chemistry]				
Schedule number	M44630310	Subject area	Advanced Environmental and Life Sciences	Required or elective	Elective
Time of starting a course	Fall1 term	Day of the week,period	Mon.4~4	Credit(s)	1
Faculty	Graduate Program for Master's Degree			Subject grade	1~2
Department Offered	Environmental and Life Sciences			Begging grade	M1, M2
Charge teacher name[Roman alphabet mark]	齊戸 美弘 SAITO Yoshihiro				
Numbering					
Objectives of class	<p>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.</p>				
Contents of class	<ol style="list-style-type: none">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					
Notes for textbook	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.				
Examination	By Report				
Details of examination					
Other information	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.				
Relations to attainment objectives of learning and education					
Key words					

(M44630320)Applied Physical Chemistry[Applied Physical Chemistry]

Subject name[English]	Applied Physical Chemistry[Applied Physical Chemistry]				
Schedule number	M44630320	Subject area	Advanced Environmental and Life Sciences	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	Environmental and Life Sciences			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	松本 明彦 MATSUMOTO Akihiko				
Numbering					
Objectives of class					
Intermolecular interaction plays a key role in interfacial characteristics such as a mechanical property of composite materials, adsorption and separation features of molecules by porous solids. This course deals with fundamental aspect of the composite materials and basic principle of the intermolecular interaction. The adsorption and separation phenomena are also implemented based on the molecular interaction.					
Contents of class					
1.Composite materials overview 2.Formation of interface and interfacial free energy 3.Molecular interaction 3-1 Electrostatic interaction, 3-2 Orientation interaction, 3-3 Induced interaction 3-4 Dispersion interaction 4.Adsorption and related phenomena 5.Control of interface interaction by regulation of the chemical structure of the interface					
Self Preparation and Review					
Related subjects					
Basic understanding on physical chemistry is desirable.					
Notes for textbook					
Reference handouts will be provided in the class.					
(Reference books)					
[For molecular interaction]					
1. J. N. Israelachvili Intermolecular and Surface Forces, 3rd Ed., Academic Press (2011). 2. Interface chemistry: D. H. Everett, Basic Principles of Colloid Science, Royal Society of Chemistry(1988).					
[For adsorption]					
1. F. Rouquerol, J. Rouquerol and K.S.W. Sing, Adsorption by Powders and Porous solids, Academic Press (1999)					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
30 % Homework report and/or Quiz, 70 % Final examination or report					
Examination					
By Report					
Details of examination					
Other information					
A. Matsumoto: room # B-505, E-mail: aki*at*ens.tut.ac.jp (Please replace "*at*" to "@" when e-mailing)					
Reference URL					
Office hours					

Relations to attainment objectives of learning and education

Key words

(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	M1, M2
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.				
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement	Report				
Examination	その他 By Report				
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	M2
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.				
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement	Report				
Examination	その他 By Report				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]				
Schedule number	M45610030	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	S5系教務委員, 5系各教員 5kei kyomu iin-S, 5kei kakukyoin				
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).				
Contents of class	The subjects and the contents of the thesis vary depending on the laboratory. All students must present their thesis at the end of the course and take a final examination on the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor(s).				
Self Preparation and Review					
Related subjects	TBD by the laboratory				
Notes for textbook	TBD by the laboratory				
Notes for reference					
Goals to be achieved					
Evaluation of achievement	This credit is assigned for all the process for the preparation and presentation of the thesis.				
Examination	その他 By Report				
Details of examination					
Other information	Refer to administration office.				
Reference URL	Refer to the URL of each laboratory				
Office hours	Refer to administration office.				
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]				
Schedule number	M45610030	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Required
Time of starting a course	2Years	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	1~2
Department Offered	Architecture and Civil Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering	ARC_MAS51025				
Objectives of class					
This thesis research on architecture and civil engineering is designated to deepen the knowledge and enhance the skills of the students in their research fields through the self-oriented endeavour with the instruction of his/her supervisor(s).					
Contents of class					
The subjects and the contents of the thesis vary depending on the laboratory. All students must present their thesis at the end of the course and take a final examination on the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor(s).					
Self Preparation and Review					
Related subjects					
TBD by the laboratory					
Notes for textbook					
TBD by the laboratory					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
This credit is assigned for all the process for the preparation and presentation of the thesis.					
Examination					
その他 By Report					
Details of examination					
Other information					
Refer to administration office.					
Reference URL					
Refer to the URL of each laboratory					
Office hours					
Refer to administration office.					
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Thesis Research on Architecture and Civil Engineering[Thesis Research on Architecture and Civil Engineering]				
Schedule number	M4561003T	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~2
Department Offered	Architecture and Civil Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering					
Objectives of class	This thesis research on architecture and civil engineering is designated to deepen the knowledge and enhance the skills of the students in their research fields through the self-oriented endeavour with the instruction of his/her supervisor(s).				
Contents of class	The subjects and the contents of the thesis vary depending on the laboratory. All students must present their thesis at the end of the course and take a final examination on the thesis, as a requirement for the graduation of the master course. The study for the thesis is planned and conducted under the guidance of the supervisor(s).				
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement	This credit is assigned for all the process for the preparation and presentation of the thesis.				
Examination	By Report				
Details of examination					
Other information	Refer to administration office.				
Reference URL	Refer to the URL of each laboratory				
Office hours	Refer to administration office.				
Relations to attainment objectives of learning and education					
Key words					

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

Subject name[English]	Seminar on Architecture and Civil Engineering[Seminar on Architecture and Civil Engineering]				
Schedule number	M45610040	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	6
Faculty	Graduate Program for Master's Degree			Subject grade	2~2
Department Offered	Architecture and Civil Engineering			Beggining grade	M2
Charge teacher name[Roman alphabet mark]	S5系教務委員 5kei kyomu Iin-S				
Numbering					
Objectives of class	All the students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.				
Contents of class	In each seminar, students pursue several research topics and/or undertake projects collectively and solely under the instruction of the faculty members of the department and/or those of other departments.				
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement	Report				
Examination	By Report				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(M45630020)Finite Element Method for Continua and Bar Structures[Finite Element Method for Continua and Bar Structures]

Subject name[English]	Finite Element Method for Continua and Bar Structures[Finite Element Method for Continua and Bar Structures]				
Schedule number	M45630020	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	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	中澤 祥二 NAKAZAWA Shoji				
Numbering					
Objectives of class					
The course provides fundamentals for static analysis by using Finite Element Analysis and computer programming for simple bar, such as truss structures.					
Contents of class					
1. Fields for application and fundamentals of elasticity 2-3 Virtual work for displacement field applied to bars 3-4 Minimum potential energy principle for displacement field applied to bars 5-6 Stiffness method (Finite Element Method) for truss structures 7. Load matrix for truss structures 8. Global equation and solution for linear equations with multi-degrees of freedom 9-12 Structure of FEM program 13-14 Examples for analysis 15. Introduction for extension to 3D beam elements					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Lecture materials are distributed to students as handout.Powerpoint files are available for students as well.					
Reference1	Book title	Concepts and Applications of finite Element Analysis		ISBN	
	Author	Robert D. Cook	Publisher	Publish year	
Notes for reference					
Goals to be achieved					
To understand the energy principle (theory of minimum potential energy and principle of virtual work) To understand the Stiffness method (Finite Element Method) for truss structures To understand the FEM programing and solution for linear equations with multi-degrees of freedom 6. Structure of FEM program 7. Examples for analysis 8. Introduction for extension to 2D elements					
Evaluation of achievement					
Students are evaluated by the term report(100%). [Evaluation basis] Students who attend all classes will be evaluated as follows: A: Achieved all goals and obtained total points of exam and reports, 80 or higher (out of 100 points). B: Achieved 65 % of goals and obtained total points of exam and reports, 65 or higher (out of 100 points). C: Achieved 55 % of goals and obtained total points of exam and reports, 55 or higher (out of 100 points).					
Examination					
By Report					
Details of examination					
Other information					
Contact to Shoji Nakazawa :					

Room : D-816, Phone :6857
E-mail : nakazawa@ace.tut.ac.jp

Reference URL

<http://www.st.ace.tut.ac.jp/~nakazawa>

Office hours

16:30 to 17:30 on every Monday

Relations to attainment objectives of learning and education

Key words

(M45630050)Geotechnical Analysis[Geotechnical Analysis]

Subject name[English]	Geotechnical Analysis[Geotechnical Analysis]				
Schedule number	M45630050	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Fall term	Day of the week,period	Thu.3~3	Credit(s)	2
Faculty	Graduate Program for Master's Degree			Subject grade	1~2
Department Offered	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	三浦 均也 MIURA Kinya				
Numbering					
Objectives of class					
Understand the concept of analytical methods for flow problem in geotechnical engineering, and master the associated mathematical calculation methods.					
Contents of class					
Introductory guidance					
01. Fundamentals of trigonometric function					
02. Unification of trigonometric function and exponential function					
03. Fourier series					
04. Complex Fourier series					
05. Expansion of Fourier analysis					
Midterm exam					
06. Governing equation for flow problem					
07. Exact solution of 1-D steady problem					
08. Solution by means of Fourier Transformation for 1-D Steady Problem					
09. Solution for Steady 2-D and 3-D steady problem					
10. Exact solution of 2-D flow problem					
11. Numerical solution by means of Weighted Residuals Method (WRM)					
12. Numerical solution by means of Finite Difference Method (FDM)					
13. Numerical solution by means of Finite Element Method (FEM)					
Term-end exam					
Self Preparation and Review					
Related subjects					
Geolpgic hazards and mitigation planning (English Masre course)					
Notes for textbook					
Handouts are distributed at the lectures					
Notes for reference					
Goals to be achieved					
Understanding the basic concept of analytical method for flow problems in geotechnical analysis.					
Evaluation of achievement					
The achievement is evaluated based on the report.					
Examination					
その他					
By Report					
Details of examination					
Other information					
D803, Tel: 0532-44-6844, Mail: k-miura@ace.tut.ac.jp					
Reference URL					
under preparing					
Office hours					
12:00-14:00 on Wednesday					
Relations to attainment objectives of learning and education					

not specified

Key words

Disaster, Earthquake, Geologic Hazards, Numerical Analysis

(M45630160)Modeling Regional Environment[Modeling Regional Environment]

Subject name[English]	Modeling Regional Environment[Modeling Regional Environment]				
Schedule number	M45630160	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	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	宮田 譲 MIYATA Yuzuru				
Numbering					
Objectives of class					
To understand the analysis of regional economic activities. To understand the interaction between the natural environment and the regional economy.					
Contents of class					
This class discusses the interaction between the natural environment and the regional economic activities by employing mathematical/numerical models. Details of the lecture are described as follows:					
Topics					
1. The first and second lectures; integrated environmental and economic accounting					
2. The third and fourth lectures; waste and economic accounting matrix					
3. The fifth to seventh lectures; computable general equilibrium analysis of a regional environmental and economic system					
4. The eighth to tenth lectures; an intertemporal model of a regional environmental and economic system					
5. The eleventh and twelfth lectures; environmental tax and the emissions trading					
6. The thirteenth to fifteenth lectures; sustainable growth in the environmental and economic dynamics					
Self Preparation and Review					
Students are required to read carefully the handout distributed at the lecture.					
Related subjects					
microeconomics (undergraduate), macroeconomics(undergraduate), environmental economics (master course)					
Textbook1	Book title	Intermediate Microeconomics		ISBN	978-0-393-12396-8
	Author	Hal R. Varian	Publisher	Norton and Company	Publish year 2014
Notes for textbook					
Lecture materials are distributed to students as handout. Powerpoint files are available for students as well.					
Notes for reference					
Goals to be achieved					
By applying mathematical/numerical models; To understand the analysis of regional economic activities. To understand the interaction between the natural environment and the regional economy.					
Evaluation of achievement					
Students are evaluated by the term report (100%).					
Examination					
By Report					
Details of examination					
Other information					
room # : D806 phone : 0532-44-6955 e-mail address : miyata@ace.tut.ac.jp					
Reference URL					
http://pm.hse.tut.ac.jp/kakenA/					
Office hours					
16:00 to 17:00 on every Tuesday					

Relations to attainment objectives of learning and education

Key words

computable general equilibrium model, global environmental problems, regional sustainable development

(M45630170)Management of Technology[Management of Technology]

Subject name[English]	Management of Technology[Management of Technology]				
Schedule number	M45630170	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	Architecture and Civil Engineering			Beggining grade	M1, M2
Charge teacher name[Roman alphabet mark]	藤原 孝男 FUJIWARA Takao				
Numbering					
Objectives of class					
<p>The main objective is to understand the function of technological entrepreneurship for commercialization of basic research findings from a perspective of financial engineering.</p> <p>Especially the decision-making model is examined for irreversible investment under uncertainty.</p>					
Contents of class					
<p>From a view point of regarding the technological development as investment in risky but promising projects, this class has following topics:1)Technological Entrepreneurship, 2)Technological Management Decision, 3)Investment Science, 4)Real Options, 5)Game Theory, and 6)Eco-system for high-tech entrepreneurship or start-ups.</p> <p>This academic year's schedule (each week) regarding real options will be following:</p> <p>1-2: What is real options? 3-4: Net Present Value as benchmark 5: Decision tree 6-7: Simple options 8-9: Compounded options and switching options 10-11: Multi-period steps 12-13: The 4-stage evaluation method for real options 14-15: Volatility estimation</p>					
Self Preparation and Review					
Related subjects					
Management Science (English), Operations Management (Japanese), Game Theory (Japanese), Real Options (Japanese), Entrepreneurship (Japanese), Management(Japanese) & Innovation Management (Japanese).					
Notes for textbook					
Study materials will be introduced at first class date.					
Notes for reference					
Goals to be achieved					
<p>1)Able to understand the function of business plan for transformation of technological ideas into economic value.</p> <p>2)Able to understand the risk-hedge model for irreversible investment under uncertainty.</p> <p>3)Able to understand the necessary of strategic response to competitors for survival.</p>					
Evaluation of achievement					
<p>[Evaluation criteria] Students attending all classes will be evaluated as follows:</p> <p>A: Achieved at least 80% goals and obtained total points of exam and reports, 80 or higher (out of 100 points).</p> <p>B: Achieved at least 65% of goals and obtained total points of exam and reports, 65 or higher (out of 100 points).</p> <p>C: Achieved at least 55% of goals and obtained total points of exam and reports, 55 or higher (out of 100 points).</p>					
Examination					
その他 By Report					
Details of examination					

Other information

Office#: B-313, Phone#: 6946, e-mail: fujiwara@las.tut.ac.jp

Reference URL**Office hours**

Anytime if available.

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

Real Options, Game Theory, & Technological Entrepreneurship

(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	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	It depends on the laboratory. The resistered students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.				
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
Examination	By Report				
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	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	It depends on the laboratory. The resistered students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.				
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
Examination	By Report				
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	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	It depends on the laboratory. The resistered students are required to attend all the seminars, which is arranged by the laboratory supervisor for the special study subjects related to the current research activity of the laboratory. The scheduled program of the seminars is announced by the supervisor at the guidance of the seminar.				
Contents of class					
Self Preparation and Review					
Related subjects					
Notes for textbook					
Notes for reference					
Goals to be achieved					
Evaluation of achievement					
Examination	By Report				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					