

Syllabus

**International Doctoral Degree
Program
(2017-Spring Term)**

(D51010010)Advanced Seminar on Mechanical Engineering 1[Advanced Seminar on Mechanical Engineering 1]

Subject name[English]	Advanced Seminar on Mechanical Engineering 1[Advanced Seminar on Mechanical Engineering 1]				
Schedule number	D51010010	Subject area	Advanced Mechanical Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period		Credit(s)	4
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	D1
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering					
Objectives of class The seminar aims to enhance the ability of each student to plan and accomplish research in the field of mechanical engineering through reviewing, reading, and discussing technical papers related to his/her doctor thesis research topic.					
Contents of class Each student reads English technical papers related to his/her doctor thesis, introduces the contents of the papers and discusses them with other students and his/her supervisor.					
Self Preparation and Review					
Related subjects Inquire this of your supervisor.					
Notes for textbook Inquire this of your supervisor.					
Notes for reference					
Goals to be achieved To acquire the ability of each student to discuss his/her doctor thesis research topic and topics related to his/her research field with his/her supervisor and specialists in his/her field. To acquire the ability to write English technical papers.					
Evaluation of achievement The achivement is evaluated based on the results of paper introduction, understanding of papers, answers to questions, and on the contribution to discussion.					
Examination None during exam period					
Details of examination					
Other information Inquire this of your supervisor.					
Reference URL					
Office hours Inquire this of your supervisor.					
Relations to attainment objectives of learning and education					
Key words					

(D51010020)Advanced Seminar on Mechanical Engineering 2[Advanced Seminar on Mechanical Engineering 2]

Subject name[English]	Advanced Seminar on Mechanical Engineering 2[Advanced Seminar on Mechanical Engineering 2]				
Schedule number	D51010020	Subject area	Advanced Mechanical Engineering	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	1
Faculty	Graduate Program for Doctoral Degree			Subject grade	2~
Department Offered	Mechanical Engineering			Begging grade	D2
Charge teacher name[Roman alphabet mark]	S1系教務委員 1kei kyomu Iin-S				
Numbering					
Objectives of class	The seminar aims to enhance the ability of each student to plan and accomplish his/her research in the field of mechanical engineering through reviewing, reading, and discussing technical papers related to his/her doctor thesis research topic.				
Contents of class	Each student reads English technical papers related to his/her doctor thesis, introduces the contents of the papers and discusses them with other students and his/her supervisor.				
Self Preparation and Review					
Related subjects	Inquire this of your supervisor.				
Notes for textbook	Inquire this of your supervisor.				
Notes for reference					
Goals to be achieved	To acquire the ability of each student to discuss his/her doctor thesis research topic and topics related to his/her research field with his/her supervisor and specialists in his/her field. To acquire the ability to write English technical papers.				
Evaluation of achievement	The achievement is evaluated based on the results of paper introduction, understanding of papers, answers to questions, and on the contribution to discussion.				
Examination	None during exam period				
Details of examination					
Other information	Inquire this of your supervisor.				
Reference URL					
Office hours	Inquire this of your supervisor.				
Relations to attainment objectives of learning and education					
Key words					

(D51030010)Advanced Mechanical Systems[Advanced Mechanical Systems]

Subject name[English]	Advanced Mechanical Systems[Advanced Mechanical Systems]				
Schedule number	D51030010	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Mon.2~2	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Beggining grade	D1
Charge teacher name[Roman alphabet mark]	河村 庄造, 足立 忠晴, 竹市 嘉紀, 伊勢 智彦 KAWAMURA Shozo, ADACHI Tadaharu, TAKEICHI Yoshinori, ISE Tomohiko				
Numbering	MEC_DOC73025				
Objectives of class					
The class aims to give advanced knowledge on solid mechanics, vibration engineering or tribology.					
Contents of class					
Prof. S. Kawamura From 01 to 04 week Vibration engineering of machines and structures is lectured with current topics. Each student is assigned some examinations, and/or reviewing current papers related to the vibration engineering, and must present them. Practical modeling and simulation of structural vibration are understood through discussion based on the presentations. Topics: Vibration engineering, Modeling and simulation of dynamic phenomena and so on.					
Prof. T. Adachi From 05 to 8 week Mechanics of solids and structures including materials science is lectured with current topics. Each student is assigned some examinations, and/or reviewing current papers related to the mechanics, and must present them. Practical mechanics and design of engineering materials and mechanical structures are understood through discussion based on the presentations. Topics: Mechanics of solids and structures, Mechanical properties of materials, Design of mechanical components and so on.					
Associate Prof. Y. Takeichi From 9 to 12 week Fundamentals of tribology including materials science are lectured with current topics. Each student is assigned some examinations, and/or reviewing current papers related to the tribology, and must present them. Practical lubrication engineering and design of sliding mechanical components are understood through discussion based on the presentations. Topics: Tribology, Lubrication engineering, Surface properties, Wear of materials, Tribological coatings and so on.					
Lecturer T. Ise From 13 to 15 week Vibration engineering of structures and machine elements is lectured with current topics. Each student is assigned some examinations, and/or reviewing current papers related to the vibration engineering, and must present them. Practical data analysis and simulation of vibration are understood through discussion based on the presentations. Topics: Vibration engineering, Vibrarion data analysis, Fluid film lubrication and so on.					
Self Preparation and Review					
Related subjects					
Fundamental knowledge on solid mechanics, vibration engineering or tribology.					
Notes for textbook					
Handouts will be prepared					
Notes for reference					
Goals to be achieved					
get advanced knowledge on solid mechanics, vibration engineering or tribology.					
Evaluation of achievement					
A comprehensive report(70%) and discussion(30%)					
Examination					
その他 By Report					
Details of examination					

Other information

Tadaharu Adachi: Room D-305, E-mail: adachi@me.tut.ac.jp

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

Yoshinori Takeichi: Room D-304, E-Mail: takeichi@tut.jp

Tomohiko Ise: Room D-403, E-Mail: ise@me.tut.ac.jp

Reference URL**Office hours**

ask us by E-Mail

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

solid mechanics, vibration engineering, tribology

(D51030030)Advanced Manufacturing Processes[Advanced Manufacturing Processes]

Subject name[English]	Advanced Manufacturing Processes[Advanced Manufacturing Processes]					
Schedule number	D51030030	Subject area	Advanced Mechanical Engineering	Required or elective	Elective	
Time of starting a course	Spring term	Day of the week,period	Tue.2~2	Credit(s)	2	
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~	
Department Offered	Mechanical Engineering			Beggining grade	D1	
Charge teacher name[Roman alphabet mark]	福本 昌宏, 安井 利明, 伊崎 昌伸, 横山 誠二 FUKUMOTO Masahiro, YASUI Toshiaki, IZAKI Masanobu, YOKOYAMA Seiji					
Numbering	MEC_DOC74025					
Objectives of class						
1. Production and manufacturing of materials This subject incorporates the solid state physics, chemical thermodynamics, and transport phenomena. Students will learn coating process and properties of coated materials to improve performance of materials and to prepare solar cells, and so on. In addition, students will learn physical chemistry to produce steels and to use steels at high temperature.						
2. Joining process Students will learn principle and practical technique of newest joining process, especially, surface manufacturing process. This subject incorporates the mechanics, solid state physics, chemical thermodynamics, and transport phenomena.						
Contents of class						
1st week: Production and manufacturing of materials 1 – Chemical thermodynamics for aqueous solution.(Izaki) 2nd week: Production and manufacturing of materials 2 – Solid state physics of inorganic thin solid film (electron theory).(Izaki) 3rd week: Production and manufacturing of materials 3 – Solid state physics of inorganic thin solid film (crystal).(Izaki) 4th week: Production and manufacturing of materials 4 – Preparation and application of inorganic thin solid film with the process of soft solution.(Izaki) 5th week: Production and manufacturing of materials 5 – Fundamentals and application of evaporation .(Yokoyama) 6th week: Production and manufacturing of materials 6 – Metallurgical reaction at high temperature.(Yokoyama) 7th week: Production and manufacturing of materials 7 – Iron and steel-making process.(Yokoyama) 8th week: Production and manufacturing of materials 8 – Resource and recycling.(Yokoyama) 9th week: Joining process 1 – Introduction. (Fukumoto) 10th week: Joining process 2 – Processing and its principle of Preparation of particle distributed composite. (Fukumoto) 11th week: Joining process 3 – Bulk joining process. (Fukumoto) 12th week: Joining process 4 – Frontier and new development of spray forming. (Fukumoto) 13th week: Joining process 5 – Introduction of surface process, PVD and CVD. (Yasui) 14th week: Joining process 6 – Fundamentals of PVD and CVD. (Yasui) 15th week: Joining process 6 – New development of PVD and CVD. (Yasui) 16th week: Writing reports						
Self Preparation and Review						
Review after every class, and read the text before next class.						
Related subjects						
Joining process, surface process engineering, materials science, Physical chemistry of materials.						
Notes for textbook						
Text will be distributed.						
Reference1	Book title	Principles of Extractive Metallurgy			ISBN	0470115394
	Author	Rosenqvist	Publisher	Tapir Academic Press	Publish year	2006
Reference2	Book title	Growth and Transport in Nanostructured Materials: The Fundamentals of PVD, CVD and ALD			ISBN	3319246704
	Author	Angel Yanguas-Gil	Publisher	Springer	Publish year	2015
Reference3	Book title	Solid State Physics			ISBN	0123850304
	Author	Giuseppe Grosso,	Publisher	Academic	Publish	2013

		Giuseppe Pastori Parravicini		Press	year	
Notes for reference						
Goals to be achieved						
1) To understand crystal structure and electron state. 2) To understand evaporation pressure, activity, pH, electron potential. 3) To comprehend equilibrium and kinetics of reaction. 4) To comprehend urban mine and recycling. 5) To understand principles and mechanics on joining of metals and ceramics. 6) To understand principles, mechanics and characteristics of preparation process of thin and thick film. 7) To understand mechanical properties of composites 8) To understand how to vacuum and mean free path. 9) To understand generation of plasma and its application.						
Evaluation of achievement						
Each instructor will give students assignments. Average score is used for evaluation.						
[Evaluation basis] Students who attend all classes will be evaluated as follows:						
A: Achieved all goals and obtained total points of reports, 80 or higher (out of 100 points).						
B: Achieved 80 % of goals and obtained total points of reports, 65 or higher (out of 100 points).						
C: Achieved 60 % of goals and obtained total points of reports, 55 or higher (out of 100 points).						
Examination						
その他						
By Report						
Details of examination						
Other information						
Reference URL						
Office hours						
Any time, but inform us your visit by e-mail before your visit.						
Relations to attainment objectives of learning and education						
A broad range of expertise and the ability to carry out technological development in materials and manufacturing.						
Key words						
thin solid film, coating, evaporation, activity, spray forming, transport phenomena, thermodynamics						

(D51030050)Engineering of Intelligent Robotics[Engineering of Intelligent Robotics]

Subject name[English]	Engineering of Intelligent Robotics[Engineering of Intelligent Robotics]				
Schedule number	D51030050	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Thu.3~3	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Begginging grade	D1
Charge teacher name[Roman alphabet mark]	三好 孝典, 佐野 滋則, 真下 智昭, 佐藤 海二 MIYOSHI Takanori, SANNO Shigenori, MASHIMO Tomoaki, SATO Kaiji				
Numbering	MEC_DOC75025				
Objectives of class					
Understand design, measurement and control methods for intelligent robots such as autonomous mobile robots with human-like ability.					
Contents of class					
We provide the following schedule. Because this course is for PhD students, we can consider the requests from the PhD students.					
1st week: Modeling for robot system					
2nd week: System identification and validation					
3rd week: Observer and State Estimation					
4th week: Control system design based on model					
5th week: Report 1					
6th week: Modelling of robot mechanism					
7th week: Theory of tele-control					
8th week: Stability for delayed system					
9th week: Example of tele-operation					
10th week: Report 2					
11th week: Intelligent mechanism					
12th week: Environmental recognition and map building					
13th week: Path planning and trajectory generation					
14th week: Motion control					
15th week: Report 3					
16th week: Discussion and conclusion					
Self Preparation and Review					
Read the handouts before and after the lecture.					
Related subjects					
Fundamentals of linear algebra, differential equation, mechanics, measurement and control theory, and robotics.					
Notes for textbook					
Handouts will be prepared.					
Reference1	Book title	Introduction to Autonomous Mobile Robots (Intelligent Robotics and Autonomous Agents series)		ISBN	
	Author	Roland Siegwart and Illah R. Nourbakhsh	Publisher	MIT Press	Publish year 2004
Notes for reference					
Goals to be achieved					
(1) Understand the design methods of intelligent robots					
(2) Understand the environmental recognition and measurement methods for intelligent robots					
(3) Understand the motion planning methods for intelligent robots					
(4) Understand the control methods for intelligent robots					
Evaluation of achievement					

Report (100 %)

A: Score of the report is 80 or higher.

B: Score of the report is 65 or higher.

C: Score of the report is 55 or higher.

Examination

By Report

Details of examination

Other information

Takanori Miyoshi, D-509, 6698, miyoshi@me.tut.ac.jp

Shigenori Sano, D-407, 6677, sano@me.tut.ac.jp

Tomoaki Mashimo, 7242, mashimo@eiiris.tut.ac.jp

Reference URL

Basic knowledge on robotics and control are required.

Office hours

Contact the professors by e-mail first.

Relations to attainment objectives of learning and education

Key words

Robot, Control, Sensor, Actuator, Mechanism, Mechanical system

(D51030070)Advanced Energy Engineering[Advanced Energy Engineering]

Subject name[English]	Advanced Energy Engineering[Advanced Energy Engineering]				
Schedule number	D51030070	Subject area	Advanced Mechanical Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Fri.4~4	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Mechanical Engineering			Begging grade	D1
Charge teacher name[Roman alphabet mark]	鈴木 孝司, 中村 祐二 SUZUKI Takashi, NAKAMURA Yuji				
Numbering	MEC_DOC76025				
Objectives of class					
The aim of the present lecture is to understand the basic equation governed by the combustion system (known as “complex” physics), and how to simplify to predict the phenomena.					
Contents of class					
*Introduction : (2 weeks) Classification of combustion Introduction of basic equation Ways to a simplification *Chemical reaction –chemical system without transport effect– (2 weeks) Overview of fundamental idea of chemical reaction equilibrium state reaction rate expression, reaction model (simplified) *Ignition theory –chemical system with simplified transport effect– (2 weeks) Definition of delay time Frank–Kamenetskii’ s theory *Premixed flame theory –chemical system with transport effect (1); chemical–controlled– (3 weeks) Rankine–Hugoniot equation Premixed flame structure Prediction of burning rate (asymptotic analysis) Instability analysis *Diffusion flame theory –chemical system with transport effect (2); transport–controlled– (4 weeks) Mixture fraction analysis Fendell curve Burke–Schumann flame theory Droplet combustion (B–number theory for heterogeneous combustion) *Combustion modeling : (2 weeks) Prediction of regression rate of solid propellant Fire modeling *Final Exam (1 week)					
Self Preparation and Review					
Students MUST be pre–studied the related area, especially for applied mathematics, fluid dynamics and thermodynamics (advance level is strongly preferred).					
Related subjects					
Applied mathematics, fluid dynamics, thermodynamics for advanced level. Basic combustion (preferred)					
Notes for textbook					
Instructors will provide the materials, if necessary.					
Reference1	Book title	The Molecular Theory of Gases and Liquids		ISBN	
	Author	J.O. Hirschfelder, C.F. Curtiss, R.B. Bird	Publisher	John Wiley and Sons	Publish year 1954
Reference2	Book title	Combustion Physics		ISBN	
	Author	C.K. Law	Publisher	Cambridge University	Publish year 2006

				Press		
Reference3	Book title	Combustion Theory			ISBN	
	Author	F.A. Williams	Publisher	Addison-Wesley	Publish year	1985
Notes for reference						
[additional references]						
<ul style="list-style-type: none"> - Fundamentals of Fire Phenomena/J.G. Quintiere : John Wiley and Sons, 2009 - Fundamental Aspects of Combustion/A. Linan & F.A. Williams : Oxford Univ. Press, 1993 - Combustion Analysis (in Japanese)/T. Niioka : Tohoku Univ. Press, 2003 - any textbook for applied math book dealing with asymptotic analysis (perturbation theory) is good to have in your hand 						
Goals to be achieved						
The goal is to understand the combustion theory; learn one of effective ways to simplify the complex (multi-scale, multi-physics) problem.						
Evaluation of achievement						
50%: assignments (several assignments are requested during the term), 50%: final exam.						
[Evaluation basis]						
Students who attend all classes will be evaluated as follows:						
A: Achieved all goals and obtained total points of exam and reports, 80 or higher (out of 100 points).						
B: Achieved 80 % of goals and obtained total points of exam and reports, 65 or higher (out of 100 points).						
C: Achieved 60 % of goals and obtained total points of exam and reports, 55 or higher (out of 100 points).						
Examination						
Examination(Face to Face)						
Details of examination						
Final exam will be interview style (oral examination): it could be written exam according to the number of students.						
Student can bring any printed items during examination.						
Other information						
M/A						
Reference URL						
Office hours						
Anytime when instructor is available: send mail to instructor to book your time for personal meeting						
Relations to attainment objectives of learning and education						
Key words						
combustion analysis, combustion theory						

(D52010020)Seminar on Electrical and Electronic Information Engineering 2[Seminar on Electrical and Electronic Information Engineering 2]

Subject name[English]	Seminar on Electrical and Electronic Information Engineering 2[Seminar on Electrical and Electronic Information Engineering 2]				
Schedule number	D52010020	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 Doctoral Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	D1
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 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					

(D52010030)Seminar on Electrical and Electronic Information Engineering 3[Seminar on Electrical and Electronic Information Engineering 3]

Subject name[English]	Seminar on Electrical and Electronic Information Engineering 3[Seminar on Electrical and Electronic Information Engineering 3]				
Schedule number	D52010030	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)	1
Faculty	Graduate Program for Doctoral Degree			Subject grade	2~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	D2
Charge teacher name[Roman alphabet mark]	S2系教務委員 2kei kyomu Iin-S				
Numbering	ELC_DOC71015				
Objectives of class					
The seminar aims to provide a broad understanding of theoretical and experimental appooches 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					

(D52030010)Advanced Electronic Materials 1[Advanced Electronic Materials 1]

Subject name[English]	Advanced Electronic Materials 1[Advanced Electronic Materials 1]				
Schedule number	D52030010	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Wed.4~4	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	D1
Charge teacher name[Roman alphabet mark]	福田 光男, 内田 裕久, 服部 敏明, 中村 雄一 FUKUDA Mitsuo, UCHIDA Hironaga, HATTORI Toshiaki, NAKAMURA Yuichi				
Numbering	ELC_DOC74025				
Objectives of class					
Objective of this subject is to learn about the forefront research and development on spin electronics and photonics in electronic materials, materials processing, and thermoelectrics.					
Contents of class					
1. Photonics. You will learn about optoelectronic materials and some typical device structures. 1) Light emitting device, 2) optical detector, 3) Optical modulator, 4)nanomaterial.					
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.					
3. Caloritronics You will learn about materials processing and thermoelectric conversion. 1) thermodynamics, 2) processing and 3) thermoelectrics					
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 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					
Photonics: Mitsuo Fukuda: fukuda@ee.tut.ac.jp Spin electronics: Hironaga Uchida: uchida@ee.tut.ac.jp Caloritronics: Yuuichi Nakamura: nakamura@ee.tut.ac.jp					
Reference URL					

Office hours

Please make an appointment via e-mail.

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

spin electronics, photonics, processing, thermoelectrics.

(D52030040)Advanced Electrical Systems 2[Advanced Electrical Systems 2]

Subject name[English]	Advanced Electrical Systems 2[Advanced Electrical Systems 2]				
Schedule number	D52030040	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Wed.2~2	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	D1
Charge teacher name[Roman alphabet mark]	須田 善行, 稲田 亮史, 村上 義信 SUDA Yoshiyuki, INADA Ryoji, MURAKAMI Yoshinobu				
Numbering	ELC_DOC73025				
Objectives of class					
<p>This lecture is implemented as an introduction to electrical energy systems and intended for students and other engineering disciplines. It is being useful as reference and self-study guide for the professional dealing with this important area. There are following three sub courses to choose from.</p> <p>This lecture is implemented as an introduction to electrical energy systems and intended for students and other engineering disciplines. It is being useful as reference and self-study guide for the professional dealing with this important area. There are following three sub courses to choose from.</p>					
Contents of class					
<p>Sub Course 1(Y. Suda)</p> <ol style="list-style-type: none"> 1. Fundamental concept of electrical energy engineering 2. Three-phase systems 3. Power electronics <p>Sub Course 2(R. Inada)</p> <ol style="list-style-type: none"> 1. Introduction of Electrochemical Energy Conversion Devices 2. Fundamentals of Electrochemical Energy Conversion Devices 3. Lithium-Ion Secondary Batteries (1) 4. Lithium-Ion Secondary Batteries (2) 5. Recent Trend in Electrochemical Energy Conversion Devices <p>Sub Course 3(Yo. Murakami)</p> <ol style="list-style-type: none"> 1. Introduction of Electric Energy Systems (1 week) 2. High Voltage Engineering and Electrical Insulation (2 week) 3. Fundamental Measurement and Its Properties of Dielectrics and Electrical Insulating Materials(2 week) <p>Sub Course 1(Y. Suda)</p> <ol style="list-style-type: none"> 1. Fundamental concept of electrical energy engineering 2. Three-phase systems 3. Power electronics <p>Sub Course 2(R. Inada)</p> <ol style="list-style-type: none"> 1. Introduction of Electrochemical Energy Conversion Devices 2. Fundamentals of Electrochemical Energy Conversion Devices 3. Lithium-Ion Secondary Batteries (1) 4. Lithium-Ion Secondary Batteries (2) 5. Recent Trend in Electrochemical Energy Conversion Devices <p>Sub Course 3(Yo. Murakami)</p> <ol style="list-style-type: none"> 1. Introduction of Electric Energy Systems 2. High Voltage Engineering and Electrical Insulation 3. Fundamental Properties of Dielectrics and Electrical Insulating Materials. 					
Self Preparation and Review					
Related subjects					
<p>Basic electrical power engineering course is prerequisite.</p> <p>Basic electrical power engineering course is prerequisite.</p>					
Notes for textbook					
Materials will be prepared by the lecturer.					

Materials will be prepared by the lecturer.

Reference1	Book title	Fuel Cell Systems Explained			ISBN	
	Author	J. Larminie and A. Dicks	Publisher	Wiley	Publish year	
Reference2	Book title	Lithium Ion Batteries: Science and Technologies			ISBN	
	Author	M. Yoshio, R.J. Brodd and A. Kozawa	Publisher	Springer-Verlag	Publish year	
Reference3	Book title	High Voltage Engineering			ISBN	
	Author	E. Kuffel, W. Zaengel and J. Kuffel	Publisher	Newnes	Publish year	
Notes for reference						
Goals to be achieved						
Evaluation of achievement Marks are based on examinations(100%). Marks are based on examinations(100%).						
Examination 定期試験を実施(対面) Examination(Face to Face)						
Details of examination						
Other information						
Reference URL						
Office hours						
Relations to attainment objectives of learning and education						
Key words						

(D52030050)Advanced Microelectronics 1[Advanced Microelectronics 1]

Subject name[English]	Advanced Microelectronics 1[Advanced Microelectronics 1]				
Schedule number	D52030050	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Wed.1~1	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	D1
Charge teacher name[Roman alphabet mark]	澤田 和明, 石川 靖彦, 関口 寛人, 高橋 一浩 SAWADA Kazuaki, ISHIKAWA Yasuhiko, SEKIGUCHI Hiroto, TAKAHASHI Kazuhiro				
Numbering	ELC_DOC74025				
Objectives of class					
From the viewpoint of deep understanding of advanced microelectronics, physics of semiconductors including material design and an example of latest device will be lectured.					
Contents of class					
a) Physics and Properties of Semiconductors Crystal growth and device processing Energy band engineering Alloy semiconductor Strain effect Superlattice Carrier transport phenomena Tummeling effect					
b)Metal-Semiconductor Contacts Schottky barrier Current transport processes Ohmic contact					
c) Integrated circuits device processing MEMS/NEMS Latest MOS FETs Current topics in IC/MEMS					
Self Preparation and Review					
Related subjects					
The basic knowledge on the quantum mechanics, thermodynamics, and electronics are desirable.					
Semiconductor Physics, Master course					
Notes for textbook					
Physics of Semiconducotr Devices S.M.Sze, Willy					
Notes for reference					
Goals to be achieved					
(1) To understand fundamental aspects on microelectronics, and physics of semiconductors including material design. (2) To get the knowledge on the latest technologies on microelectronics.					
Evaluation of achievement					
Reports (100%)					
Examination					
その他 By Report					
Details of examination					
Other information					

K.Sawada (C-605)

sawada@ee.tut.ac.jp

ext. 6739

H. Sekiguchi (C-610)

sekiguchi@ee.tut.ac.jp

ext. 6744

K. Takahashi (C-406)

takahashi@ee.tut.ac.jp

ext. 6740

Reference URL

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

(department)

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

(division)

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

(research activities)

Office hours

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

Relations to attainment objectives of learning and education

Key words

(D52030070)Advanced Information and Communication Systems 1[Advanced Information and Communication Systems 1]

Subject name[English]	Advanced Information and Communication Systems 1[Advanced Information and Communication Systems 1]				
Schedule number	D52030070	Subject area	Advanced Electrical and Electronic Information Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Mon.2~2	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Electrical and Electronic Information Engineering			Beggining grade	D1
Charge teacher name[Roman alphabet mark]	大平 孝, 上原 秀幸, 竹内 啓悟 OHIRA Takashi, UEHARA Hideyuki, TAKEUCHI Keigo				
Numbering	ELC_DOC75025				
Objectives of class					
<p>Students select one course from the following three courses:</p> <p>A first course is intended for learning how to design microwave circuits needed for advanced wireless communication systems and wireless power transmission systems. The distributed constant element theory is addressed to characterize linear circuits at high frequencies. Based on this technique, students challenge synthesis of a variety of microwave signal and power processing functions.</p> <p>A second course is intended for learning mainly medium access control, multi-hop communications and other topics related to wireless networks. Students are required to give solutions of the problems which cause performance degradation.</p> <p>The last course is intended for learning point-to-point communication systems, multiuser communication systems, and multiple-input multiple-output (MIMO) systems in the physical layer of wireless communications. Students challenge a unified understanding of existing advanced schemes in wireless communications.</p>					
Contents of class					
<p>Course 1 provided by Prof. Ohira:</p> <ol style="list-style-type: none"> 1. Transmission lines 2. Scattering matrix 3. Mizuhashi Smith chart <p>Course 2 provided by Prof. Uehara:</p> <ol style="list-style-type: none"> 1. Medium access control protocols 2. Multi-hop communications 3. Ad hoc and sensor networks <p>Course 3 provided by Prof. Takeuchi:</p> <ol style="list-style-type: none"> 1. Point-to-point communication systems 2. Multiuser communication systems 3. MIMO systems 					
Self Preparation and Review					
Related subjects					
<p>Course 1: Deep understanding on electromagnetic field theory, linear passive and reciprocal circuit theory, and sophisticated experience on complex and matrix mathematics are prerequisite.</p> <p>Course 2: The students who will take this course are supposed to have sufficient knowledge about the following; wireless digital modulation and demodulation, radio propagation characteristic, signal processing, probability, random variables and stochastic process.</p> <p>Course 3: Basic understanding on modulation/demodulation, signal processing, probability theory, and information theory are prerequisite.</p>					
Notes for textbook					
Course 1: Lecture on the blackboard without resorting to textbooks.					

Course 2: Instruct in 1st class.

Course 3: Same as Course 2.

Notes for reference

Goals to be achieved

Course 1:

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

Course 2:

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

Course 3:

- Understand the concept of detection, diversity, and channel uncertainty in point-to-point communication systems.
- Understand resource allocation and interference management in multiuser communication systems.
- Understand statistical channel models and basic multiuser detection schemes in MIMO systems.

Evaluation of achievement

Course 1: Marks are based on the final test.

Course 2: Marks are based on reports and presentations.

Course 3: Marks are based on reports and tests.

Examination

Examination(Face to Face)

Details of examination

Other information

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

Reference URL

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

Office hours

Appoint a time slot via email

Relations to attainment objectives of learning and education

Key words

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

(D53010010)Seminar on Computer Science and Engineering 1[Seminar on Computer Science and Engineering 1]

Subject name[English]	Seminar on Computer Science and Engineering 1[Seminar on Computer Science and Engineering 1]				
Schedule number	D53010010	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 Doctoral Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	D1
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					

(D53010020)Seminar on Computer Science and Engineering 2[Seminar on Computer Science and Engineering 2]

Subject name[English]	Seminar on Computer Science and Engineering 2[Seminar on Computer Science and Engineering 2]				
Schedule number	D53010020	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)	1
Faculty	Graduate Program for Doctoral Degree			Subject grade	2~
Department Offered	Computer Science and Engineering			Beggining grade	D2
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					

(D53030090)Molecular Simulation[Molecular Simulation]

Subject name[English]	Molecular Simulation[Molecular Simulation]				
Schedule number	D53030090	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Wed.1~1	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	D1
Charge teacher name[Roman alphabet mark]	栗田 典之, 後藤 仁志 KURITA Noriyuki, GOTO Hitoshi				
Numbering	CMP_DOC73125				
Objectives of class					
<p>The objective of this class is to understand basis biophysical phenomena in the organisms based on the concept of quantum chemistry, that is, molecular orbital (MO) theory.</p> <p>In achieving this objective, students will be required to attempt to acquire the elementary concepts in MO theory, and learn about the electronic properties of biological molecules such as proteins, RNA and DNA.</p> <p>The objective of this class is to understand basis biophysical phenomena in the organisms based on the concept of quantum chemistry, that is, molecular orbital (MO) theory.</p> <p>In achieving this objective, students will be required to attempt to acquire the elementary concepts in MO theory, and they will learn about the electronic properties of biological molecules such as proteins, RNA and DNA.</p>					
Contents of class					
<p>Considering the preliminary knowledge of the participates in this class, some topics from the following things will be chosen to be learned.</p> <p>(1) Basis and elementary concepts for molecular orbital (MO) theory(第1、2週)</p> <p>(2) Applications of MO method to small molecules(第3、4週)</p> <p>(3) MO calculations for amino acids and their peptides(第5、6週)</p> <p>(4) MO calculations for DNA, RNA bases and base pairs(第7、8、9週)</p> <p>(5) MO calculations for complexes with proteins and ligand molecules(第10、11、12週)</p> <p>(6) MO calculations for DNA, RNA and their complexes with proteins(第13、14、15週)</p> <p>Considering the preliminary knowledge of the participates in this class, some topics from the following things will be chosen to be learned.</p> <p>(1) Basis and elementary concepts for molecular orbital (MO) theory (1 and 2 weeks)</p> <p>(2) Applications of MO method to small molecules (3 and 4 weeks)</p> <p>(3) MO calculations for amino acids and their peptides (5 and 6 weeks)</p> <p>(4) MO calculations for DNA, RNA bases and base pairs (7, 8 and 9 weeks)</p> <p>(5) MO calculations for complexes with proteins and ligand molecules (10, 11 and 12 weeks)</p> <p>(6) MO calculations for DNA, RNA and their complexes with proteins (13, 14 and 15 weeks)</p>					
Self Preparation and Review					
Elementary concepts in MO theory as well as biomolecules such as proteins, RNA and DNA are required.					
Related subjects					
Basis knowledge about quantum chemistry and biomolecules such as proteins, RNA and DNA is required.					
Notes for textbook					
<p>教科書:資料配付</p> <p>参考書:</p> <p>"Molecular orbital calculations for amino acids and peptides", by Anne-Marie Sapse</p> <p>"Molecular orbital calculations for amino acids and peptides", by Anne-Marie Sapse</p>					
Notes for reference					
Goals to be achieved					

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

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

Evaluation of achievement

授業で与えられた課題に対するレポート内容及びその発表内容(70%)、テスト(30%)

Report (70%), Test (30%)

Examination

レポートで実施

None during exam period

Details of examination

Other information

連絡先

教員の居室:F 棟 306 号室

電話番号:0532-44-6875

E-mail: kurita@cs.tut.ac.jp

E-mail: kurita@cs.tut.ac.jp

Reference URL

Office hours

上記の E-mail による連絡により、適宜対応する。

Please contact by the above E-mail.

Relations to attainment objectives of learning and education

Key words

DNA, Protein, molecular orbital calculation

DNA, RNA, Protein, molecular orbital calculation

(D53030150)Web Data Engineering, Advanced 1[Web Data Engineering, Advanced 1]

Subject name[English]	Web Data Engineering, Advanced 1[Web Data Engineering, Advanced 1]				
Schedule number	D53030150	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Thu.2~2	Credit(s)	1
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	D1
Charge teacher name[Roman alphabet mark]	青野 雅樹 AONO Masaki				
Numbering	CMP_DOC72425				
Objectives of class					
<p>インターネット、すなわち Web 上には、大量のデータが日々作成・蓄積・更新されている。この中から有用なデータを検索し、抽出する Web アプリケーション技術や、複数の Web アプリケーション間でデータをやりとりする技術も重要になってきている。特に、このようなビッグデータをどう表現するかも、アプリケーションをカスケードする場合、必須である。</p> <p>本講義では、Web 上やデータファイルにあるテキストだけでなく、画像、動画、3D モデルなど様々なメディアに対するデータ表現技術、特徴量抽出技術、次元削減を含むインデクシング、テキストマイニング、データマイニング、自然言語処理、情報検索技術、回帰・分類・クラスタリングに代表される統計的機械学習、リンク解析に代表される Web マイニング技術、ならびに深層学習技術に焦点を当て、最新のデータサイエンス技術を講述する。</p> <p>Day by day, massive data has been generated, accumulated, and updated on the Internet, where data include texts, images, movies, 3D shapes, and their composites. Extracting important pieces of information is crucial in may Web applications. The objectives of this class is to let students know the state-of-the art technologies in data science ranging from (big) data representation, data mining, text mining, natural language processing, information retrieval, information extraction, machine learning (including both supervised and unsupervised learning plus deep learning), based on fundamental data science technologies.</p>					
Contents of class					
<p>(1)はじめに(Web で扱うデータ、データサイエンス、統計的機械学習の基礎)</p> <p>(2)情報検索序論(検索、類似度、言語モデル、次元削減、評価尺度)、自然言語処理の基礎</p> <p>(3)マルチメディア特徴量抽出、検索、分類、深層学習基礎</p> <p>(4)リンク解析、教師なし学習(クラスタリング技術)</p> <p>(5)時系列データマイニング、教師あり学習(特徴抽出と分類)</p> <p>(6)教師あり学習(特徴抽出と回帰)、評価手法、深層学習事例</p> <p>(7+0.5)定期テスト</p> <p>(1) Introduction (Basics of Data Science including Data Representation and Statistical Machine Learning)</p> <p>(2) Information Retrieval (Search, Similarity, Language Model, Dimensional Reduction, Evaluations), and Natural Language Processing</p> <p>(3) Multimedia Feature Extraction, Search, Classification, Deep Learning Basics</p> <p>(4) Web Link Analysis, Unsupervised Learning (Clustering)</p> <p>(5) Time Series Data Mining, Supervised Learning (Classification)</p> <p>(6) Supervised Learning (Regression), Evaluations, and Deep Learning Examples</p> <p>(7+0.5) Final Exam</p>					
Self Preparation and Review					
<p>基本的なデータマイニング技術(主成分分析・判別分析・回帰分析、クラスタリング)に関しては、各自、予習・復習をしておくこと。特に、授業の補助用 Web ページで、Python (Jupyter notebook) を使った自習教材を準備するので、慣れておくことが好ましい。</p> <p>It is desirable to self-study as well as to review fundamental data mining techniques such as clustering, classification, and regression. It should be noted that the knowledge on machine learning and multivariate analysis techniques such as principal component analysis is a prerequisite to this class. It is recommended installing Python into your computer, because some of the lecture materials are assumed the knowledge of Python.</p>					
Related subjects					
Notes for textbook					

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

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

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

Notes for reference

参考書 5

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

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

出版社 : Addison Wesley

ISBN : 978-0-321-41691-9

出版年 : 2011

参考書 6

書名「Google's PageRank and Beyond」

著者名 : Amy N. Langville, Carl D. Meyer

出版社 : Princeton University Press

ISBN : 978-0-691-12202-1

出版年 : 2006

Reference #5

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

Authors: Ricardo Baeza-Yates, Bertier Ribeiro-Neto

Publisher: Addison Wesley

ISBN: 978-0-321-41691-9

Year: 2011

Reference #6

Title:「Google's PageRank and Beyond」

Authors: Amy N. Langville, Carl D. Meyer

Publisher: Princeton University Press

ISBN: 978-0-691-12202-1

Year: 2006

Goals to be achieved

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

The following items have to be achieved:

1. Able to implement and apply fundamental data science (mining) technologies.
2. Able to understand fundamental technologies of information retrieval such as natural language processing, search performance measures, feature extraction, and ranking methods such as language model
3. Able to understand basics of machine learning (classification, regression, clustering) and deep learning

4. Able to understand basics of Web link analysis, Wen content mining, Time series data mining

Evaluation of achievement

原則として、すべての授業に出席したのにつき、下記のように成績を評価する。

定期試験 80 点、課題 20 点の合計で評価する。

A: 80 点以上, B: 65 点以上, C: 55 点以上

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

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

A: (≥ 80), B: (≥ 65), C: (≥ 55)

Examination

定期試験を実施(対面)

Examination(Face to Face)

Details of examination

Other information

C-511、TEL: 6764, Email: aono@tut.jp

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

Reference URL

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

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

Office hours

随時だが、事前に aono@tut.jp まで電子メールで予約をとること。

Anytime, but it is recommended that a priori email appointment is preferable.

Relations to attainment objectives of learning and education

Key words

データ・テキストマイニング、情報検索、特徴量抽出、機械学習、深層学習

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

(D53030230)Advanced Statistical Natural Language Processing[Advanced Statistical Natural Language Processing]

Subject name[English]	Advanced Statistical Natural Language Processing[Advanced Statistical Natural Language Processing]				
Schedule number	D53030230	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Wed.2~2	Credit(s)	1
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	D1
Charge teacher name[Roman alphabet mark]	秋葉 友良 AKIBA Tomoyoshi				
Numbering	CMP_DOC72325				
Objectives of class					
Important topics on statistical natural language processing will be discussed by focusing on statistical machine translation.					
Contents of class					
Week 1: Introduction					
Week 2: Basic of Probability and Statistics					
Week 3: Language Models					
Week 4: Translation Models					
Week 5: Parameter Estimation					
Week 6: EM Algorithm					
Week 7: Advanced methods in SMT					
Self Preparation and Review					
Related subjects					
Information theory, Formal language theory					
Notes for textbook					
Resumes will be provided, which are based on:					
•Kevin Knight					
A Statistical MT Tutorial Workbook					
•Seiichi Nakagawa et al.					
Spoken Language Processing and Natural Language Processing					
Reference1	Book title	Statistical Machine Translation		ISBN	978-0521874151
	Author	Philipp Koehn	Publisher	Cambridge University Press	Publish year
					2010
Reference2	Book title	A Statistical MT Tutorial Workbook		ISBN	
	Author	Kevin Knight	Publisher		Publish year
Notes for reference					
Goals to be achieved					
Basics: Understand the basic concepts of natural language processing					
Natural Language Processing: Understand the role of language resources, language and translation models, word alignments, and parameter estimation methods,					
Applications: Understand statistical machine translation system.					
Evaluation of achievement					
Marks are based on reports (100%).					
Examination					
By Report					

Details of examination**Other information**

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

Reference URL

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

Office hours

16:25-17:40, Tuesday and Wednesday

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

spoken language processing, natural language processing, human language technology

(D53030250)Advanced Molecular Information Engineering 1[Advanced Molecular Information Engineering 1]

Subject name[English]	Advanced Molecular Information Engineering 1[Advanced Molecular Information Engineering 1]				
Schedule number	D53030250	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Spring1 term	Day of the week,period	Mon.3~3	Credit(s)	1
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	D1
Charge teacher name[Roman alphabet mark]	高橋 由雅 TAKAHASHI Yoshimasa				
Numbering					
Objectives of class The purpose of this course is to introduce and explain practical and applied approaches to data analysis (or mining) and knowledge discovery with illustrative examples in chemistry and molecular biology. The course is helpful for the students who are interested in not only pursuing careers in chemo-informatics but also taking general data science.					
Contents of class Topics to be covered: 1.Chemical data space and multivariate data analysis 2.Quantitative structure-activity relationships and knowledge aquisition 3.Visualization of higher dimensional data of molecules 4.Evaluation of structural similarity and its application 5.Fundamentals of machine learning 6.Artificial neural network and chemical application 7.Support vector machine and chemical application 8.Exam.					
Self Preparation and Review					
Related subjects Molecular Informatics, Linear Algebra, Elementary Analytics					
Notes for textbook Material will be made available in the form of hard copies or on the class website (to be announced).					
Notes for reference					
Goals to be achieved /They understand regression analysis technique based on linear least squares method and the application to chemical data fitting. /They learn fundamentals of quantitative structure-activity relationships (QSAR) /They learn mathematical basis of principal component analysis and visualization of multivariate chemical data space. /They understand usefulness and importance of structural similarity in intelligent molecular information processing. /They learn mathematical basis of machine learning. /Artificial neural network (ANN) and applicaton in chemistry. /Support vector machine (SVM) and application in drug design and development. They acquire the abilities how they can apply the methods to chemical data analysis, data classification and prediction.					
Evaluation of achievement Reports and classroom performance 20% Written examination 80% [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 70 % of goals and obtained total points of exam and reports, 65 or higher (out of 100 points).

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

Examination

Examination(Face to Face)

Details of examination

Other information

Office: F-303 (Ext. 6878) Email: taka@cs.tut.ac.jp (Takahashi)

Reference URL

<http://www.mis.cs.tut.ac.jp/>

Office hours

Friday 13:00-14:30

Relations to attainment objectives of learning and education

Key words

chemoinformatics, bioinformatics, multivariate data analysis, QSAR, chemometrics, pattern recognition, machine learning, data mining

(D53030260)Advanced Molecular Information Engineering 2[Advanced Molecular Information Engineering 2]

Subject name[English]	Advanced Molecular Information Engineering 2[Advanced Molecular Information Engineering 2]				
Schedule number	D53030260	Subject area	Advanced Computer Science and Engineering	Required or elective	Elective
Time of starting a course	Spring2 term	Day of the week,period	Mon.3~3	Credit(s)	1
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Computer Science and Engineering			Beggining grade	D1
Charge teacher name[Roman alphabet mark]	未定 To be assigned				
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 定期試験を実施(対面) Examination(Face to Face)					
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(D54010010)Seminar on Environmental & Life Sciences 1[Seminar on Environmental & Life Sciences 1]

Subject name[English]	Seminar on Environmental & Life Sciences 1[Seminar on Environmental & Life Sciences 1]				
Schedule number	D54010010	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	4
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Begging grade	D1
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 advanced environmental and life sciences by reading scientific papers under the guidance of his/her supervisor. The aim of the lesson for the students is to learn the latest knowledge and presentation skills required for his/her research in the seminar as well as to deepen his/her understanding of advanced environmental and life sciences.					
Contents of class					
The students will be required to read scientific 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 & Life Sciences 2 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 advanced 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					

(D54010020)Seminar on Environmental & Life Sciences 2[Seminar on Environmental & Life Sciences 2]

Subject name[English]	Seminar on Environmental & Life Sciences 2[Seminar on Environmental & Life Sciences 2]				
Schedule number	D54010020	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Required
Time of starting a course	Year	Day of the week,period	Intensive	Credit(s)	1
Faculty	Graduate Program for Doctoral Degree			Subject grade	2~
Department Offered	Environmental and Life Sciences			Begging grade	D2
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 advanced environmental and life sciences by reading scientific papers under the guidance of his/her supervisor. The aim of the lesson for the students is to expand the knowledge and presentation skills acquired in Seminar on Environmental and Life Science 1.					
Contents of class					
The students will be required to read scientific 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 & Life Sciences 1 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 advanced 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					

(D54030010)Advanced Environmental Technology 1[Advanced Environmental Technology 1]

Subject name[English]	Advanced Environmental Technology 1[Advanced Environmental Technology 1]				
Schedule number	D54030010	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Mon.3~3	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Begging grade	D1
Charge teacher name[Roman alphabet mark]	田中 三郎, 高島 和則, 有吉 誠一郎 TANAKA Saburo, TAKASHIMA Kazunori, ARIYOSHI Seiichiro				
Numbering	ENV_DOC74225				
Objectives of class					
This course will provide the students with the opportunity to study on his/her research subject in Electromagnetism and its relation with environmental technology 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 English 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					
Notes for textbook					
Notes for reference					
Goals to be achieved					
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					
その他 Other					
Details of examination					
Other information					
Tanaka: Room: G-605, Phone: 6916, E-mail: tanakas@ens.tut.ac.jp					
Reference URL					
http://ens.tut.ac.jp/squid/					
Office hours					
Relations to attainment objectives of learning and education					
<p>環境・生命工学専攻</p> <p>(B) 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</p> <p>(C) 広範囲の知識を有機的に連携させた研究開発能力 広範囲の知識の連携による研究開発に対する方法論を体得し、研究開発の計画立案と、それを実践できる能力</p> <p>(D) 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</p>					

Key words

(D54030030)Advanced Ecological Engineering[Advanced Ecological Engineering]

Subject name[English]	Advanced Ecological Engineering[Advanced Ecological Engineering]				
Schedule number	D54030030	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Thu.2~2	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Begging grade	D1
Charge teacher name[Roman alphabet mark]	中野 裕美, 大門 裕之, 東海林 孝幸 NAKANO Hiromi, DAIMON Hiroyuki, TOKAIRIN Takayuki				
Numbering	ENV_DOC74225				
Objectives of class					
The course provides students with the opportunity to improve their level in the skills(reading, writing, presentation) through reading current research articles.					
Contents of class					
1. Students have to select at least three articles in the field of one of professors. Three weeks/professor & one week 2. Students prepare both reports and present slides. 3. The key words will be given at the first class.					
Self Preparation and Review					
Related subjects					
Knowledge of environmental chemistry, chemical engineering and materials science is desirable.					
Notes for textbook					
No textbook will be used.					
Notes for reference					
Goals to be achieved					
To improve presentation skills(writing of reports and preparing of slides).					
Evaluation of achievement					
30% Report, 70% Presentation(30-45 min)					
Examination					
By Report					
Details of examination					
Other information					
Room # G-603, E-mail: goto@ens.tut.ac.jp Room # CRFC-Center 208, E-mail: hiromi@crfc.tut.ac.jp Room # G-602, E-mail: daimon@ens.tut.ac.jp Room # G-405, E-mail: tokairin@ens.tut.ac.jp					
Reference URL					
Office hours					
Anytime, but reservation is desirable.					
Relations to attainment objectives of learning and education					
Key words					
environmental chemistry, chemical engineering, materials science, sustainable engineering					

(D54030040)Advanced Biotechnology 1[Advanced Biotechnology 1]

Subject name[English]	Advanced Biotechnology 1[Advanced Biotechnology 1]				
Schedule number	D54030040	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Fri.3~3	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Begging grade	D1
Charge teacher name[Roman alphabet mark]	浴 俊彦, 田中 照通, 中鉢 淳 EKI Toshihiko, TANAKA Terumichi, NAKABACHI Atsushi				
Numbering	ENV_DOC73225				
Objectives of class					
This course will provide the students with the opportunity to study on advanced life sciences (e.g., genomics, molecular genetics, microbiology, and biotechnology).					
Contents of class					
In this course, the students will be expected to read several papers on the current progress in advanced life science (e.g., genomics, molecular genetics, microbiology, and biotechnology) to understand the frontier of these scientific fields. This course will be given by three instructors as described below (Eki, Tanaka, and Nakabachi).					
1st~5th week: Genome and gene sciences (Dr. T. Eki)					
6th~10th week: Genetic and Protein engineering (Dr. T. Tanaka)					
11th~15th week: Animal-microbe symbioses (Dr. A. Nakabachi)					
Self Preparation and Review					
Related subjects					
The knowledge of basic molecular biology and biochemistry is absolutely essential.					
Notes for textbook					
Papers and references will be given by each instructor in the course.					
Notes for reference					
Goals to be achieved					
To understand the current status in advanced life sciences including genomics, molecular genetics, microbiology and biotechnology by summarizing, and making presentations and/or reports.					
Evaluation of achievement					
Grades for the course will be based on the average of the subject scores (by Eki, Tanaka, and Nakabachi).					
[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 70% of goals and obtained total points of exam and reports, 65 or higher (out of 100 points).					
C: Achieved 60% of goals and obtained total points of exam and reports, 55 or higher (out of 100 points).					
Examination					
None during exam period					
Details of examination					
Other information					
Dr. Toshihiko Eki: Room: G-505, Phone: 6907, E-mail: eki@ens.tut.ac.jp					
Dr. Terumichi Tanaka: Room: G-506. Phone: 6920, E-mail: terumichi-tanaka@tut.jp					
Dr. Atsushi Nakabachi: Room: G-502, Phone: 6901, E-mail: nakabachi@eiiris.tut.ac.jp					
Reference URL					
Office hours					
Please make an appointment.					
Relations to attainment objectives of learning and education					

Key words

(D54030060)Advanced Molecular Function Chemistry 1[Advanced Molecular Function Chemistry 1]

Subject name[English]	Advanced Molecular Function Chemistry 1[Advanced Molecular Function Chemistry 1]				
Schedule number	D54030060	Subject area	Advanced Applied Chemistry and Life Science	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Tue.1~1	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Environmental and Life Sciences			Beggining grade	D1
Charge teacher name[Roman alphabet mark]	伊津野 真一, 岩佐 精二, 柴富 一孝, 原口 直樹 ITSUNO Shinichi, IWASA Seiji, SHIBATOMI Kazutaka, HARAGUCHI Naoki				
Numbering	ENV_DOC72225				
Objectives of class This course focuses on state-of-the-art technology of functional polymers and synthesis as for bioactive organic compounds. Synthesis and various applications of the functional polymers and bioactive organic compounds will be discussed.					
Contents of class (1) General aspects of functional polymers (Itsuno, Haraguchi) (2) Precise molecular design of functional polymers(Itsuno, Haraguchi) (3) Preparation of highly functionalized polymers(Itsuno, Haraguchi) (4) Reactive polymer synthesis(Itsuno, Haraguchi) (5) Optically active polymers(Itsuno, Haraguchi) (6) Asymmetric synthesis and polymerization(Itsuno, Haraguchi) (7) Synthesis and structure-function relationship of biobased and biodegradable polymers(Itsuno, Haraguchi) (8) Bioactive natural products (Iwasa) (9) Total synthesis of natural products (Iwasa) (10) Transition metal complexes and 18 electron rule (Iwasa) (11) Chiral catalysts and their applications (S. Iwasa) (12) Advanced Lewis acid catalysis. (Shibatomi) (13) Advanced organocatalysis. (Shibatomi) (14) Asymmetric synthesis of halogenated compounds and their synthetic applications. (Shibatomi) (15) Advanced organofluorine chemistry (Shibatomi)					
Self Preparation and Review					
Related subjects D34030060 Advanced Molecular Function Chemistry 1 M44630100 Special Topics in Applied Organic Chemistry M24630460 応用有機化学特論					
Notes for textbook No textbooks are required.					
Notes for reference					
Goals to be achieved To understand the latest trend of the research on functional polymers. To understand the latest trend of the research on total synthesis of natural products and their synthetic methods.					
Evaluation of achievement Presentation (50%) and discussion (50%)					
Examination その他 By Report					
Details of examination					
Other information S. Itsuno: itsuno@ens.tut.ac.jp 6813 S. Iwasa: office:B-506, tel: 6817, email: iwasa@ens.tut.ac.jp K. Shibatomi: shiba@ens.tut.ac.jp (room: B-507)					
Reference URL http://www.siorgchem.ens.tut.ac.jp/index.html					

Office hours

anytime

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

functional polymer, asymmetric catalyst, transition metal, organocatalyst, Lewis acid, fluorine

(D55010010)Seminar on Architecture and Civil Engineering 1[Seminar on Architecture and Civil Engineering 1]

Subject name[English]	Seminar on Architecture and Civil Engineering 1[Seminar on Architecture and Civil Engineering 1]				
Schedule number	D55010010	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)	4
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	D1
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	By Report				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(D55010020)Seminar on Architecture and Civil Engineering 2[Seminar on Architecture and Civil Engineering 2]

Subject name[English]	Seminar on Architecture and Civil Engineering 2[Seminar on Architecture and Civil Engineering 2]				
Schedule number	D55010020	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)	1
Faculty	Graduate Program for Doctoral Degree			Subject grade	2~
Department Offered	Architecture and Civil Engineering			Beggining grade	D2
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	By Report				
Details of examination					
Other information					
Reference URL					
Office hours					
Relations to attainment objectives of learning and education					
Key words					

(D55030030)Advanced Building Environmental Engineering and Building Services[Advanced Building Environmental Engineering and Building Services]

Subject name[English]	Advanced Building Environmental Engineering and Building Services[Advanced Building Environmental Engineering and Building Services]				
Schedule number	D55030030	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Mon.5~5	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	D1
Charge teacher name[Roman alphabet mark]	都築 和代 TSUZUKI Kazuyo				
Numbering					
Objectives of class					
The goal of this course is to help professionals update related to the recent research and development on life cycle assessment (LCA) for buildings, environmental symbiotic technologies, climatic building design and urban energy management.					
Contents of class					
The course consists of the following topics.					
1. Buildings and its Impact on the Global Environment					
2. Impact Assessment indices for Buildings					
3. Life Cycle Inventory for Buildings					
4. Overview of CASBEE					
5. Environmental Symbiotic Technologies (1)					
6. Environmental Symbiotic Technologies (2)					
7. Ecological Building Design (1)					
8. Ecological Building Design (2)					
9. Climatic Building Design (1)					
10. Climatic Building Design (2)					
11. Sustainable Building Design (1)					
12. Sustainable Building Design (2)					
13. Energy and Buildings (1)					
14. Energy and Buildings (2)					
15. Compact city –urban energy management–					
Self Preparation and Review					
The course materials such book chapter or academic paper related to this course will be appeared or provided at the first class or orientation.					
Related subjects					
Building science: Indoor Air Quality and Ventilation, Building and Urban Thermal Environment					
Notes for textbook					
The related handouts will be distributed.					
Reference1	Book title	Architecture for a Sustainable Future –All about the Holistic Approach in Japan–		ISBN	
	Author	Architectural Institute of Japan	Publisher	Institute for Building Environment and Energy Conservation	Publish year
Notes for reference					
Goals to be achieved					
Achievement level of this course is to understand the background of building's impact on the global environment, the practical strategies for sustainable building design, urban energy management and so on.					
Evaluation of achievement					
Reports related to this subject are reviewed to evaluate the achievement level.					

Examination By Report
Details of examination
Other information Kazuyo Tsuzuki: D-711, Phone: 0532-44-6839, Fax: 0532-44-6831, E-mail: ktsuzuki@ace.tut.ac.jp
Reference URL
Office hours Kazuyo Tsuzuki: Thursday 13:00-14:30
Relations to attainment objectives of learning and education
Key words climatic building design, sustainable building design, building energy management, energy saving

(D55030090)Advanced Transportation Systems and Economics[Advanced Transportation Systems and Economics]

Subject name[English]	Advanced Transportation Systems and Economics[Advanced Transportation Systems and Economics]				
Schedule number	D55030090	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Tue.2~2	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Beggining grade	D1
Charge teacher name[Roman alphabet mark]	宮田 讓, 洪澤 博幸, 杉木 直 MIYATA Yuzuru, SHIBUSAWA Hiroyuki, SUGIKI Nao				
Numbering					
Objectives of class	To obtain the advanced knowledge of theories and methods for policies and planning for the environment, cities, regions and transportation.				
Contents of class	By using books, reports and papers on the environment, cities, regions and infrastructure, students learn the advanced transportation systems and transportation economics. Discussion between the lecturer and students will be performed in the lecture time.				
Self Preparation and Review					
Related subjects	Transportation systems Analysis on environmental economics Policy for industry Econometrics				
Notes for textbook	Textbooks and scientific papers will be announced at the start of the class.				
Notes for reference					
Goals to be achieved	1.To understand the necessity and significance of policy and planning for the environment, cities, regions and infrastruncure. 2.To understand the concept of policy and planning for the above mentioned fields. 3.To undestand methodologies in the above mentioned fields.				
Evaluation of achievement	Home work assignments will be required. Final reports or examination will be conducted.				
Examination	レポートで実施 By Report				
Details of examination					
Other information	room(D-806), miyata@ace.tut.ac.jp phone: 0532-44-6955				
Reference URL	Miyata: http://pm.hse.tut.ac.jp/kakenA/ Shibusawa: http://www.pm.ace.tut.ac.jp				

Office hours

Yuzuru Miyata: 16:00-17:00 in every Tuesday

Hiroyuki Shibusawa: 9:00-10:00 in every Thursday

Relations to attainment objectives of learning and education

建築・都市システム学専攻

(B) 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

Key words

planning process, social & economic evaluation method, forecasting models

(D55030110)Advanced Management of Technology[Advanced Management of Technology]

Subject name[English]	Advanced Management of Technology[Advanced Management of Technology]				
Schedule number	D55030110	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Wed.4~4	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Begging grade	D1
Charge teacher name[Roman alphabet mark]	藤原 孝男, 渋澤 博幸 FUJIWARA Takao, SHIBUSAWA Hiroyuki				
Numbering					
Objectives of class					
<p>The main objective is to understand the function of technological entrepreneurship for commercialization of basic research results from a perspective of financial engineering. Especially the decision-making model is examined for irreversible investment under uncertainty(Fujiwara).</p> <p>In this course, students learn the regional and urban economic modeling techniques and the urban and regional policy evaluation methodology(Shibusawa).</p>					
Contents of class					
<p>Fujiwara From a view point regarding the technological development as risky but competitive investment, this class has following topics: 1-2:Technological entrepreneurship 3-5:Investment decision 6-8:Basic real options 9-11:Optio valuation methods 12-15:Application and cases</p> <p>For each week class discussion, self-preview & review are expected.</p> <p>Shibusawa 1-2:Urban and Regional Policy and Evaluation 3-5:Modeling of the Urban and Regional Economic Systems 6-8:Policies and the Evaluation Methodology 9-11:Evaluation Techniques and Tools 12-13:Case Studies of the urban and regional policy 14-15:Evaluating Case Studies</p>					
Self Preparation and Review					
Related subjects					
<p>Fujiwara Management Science (English), Operations Management (Japanese), Real Options (Japanese), Game Theory (Japanese), Finance (Japanese), & Entrepreneurship (Japanese),</p> <p>Shibusawa Economics, Policy, Simulation</p>					
Notes for textbook					
<p>Fujiwara Studying materials will be introduced at first class time.</p> <p>Shibusawa Papers will be distributed.</p>					
Notes for reference					
Goals to be achieved					
Fujiwara					

- 1) Able to understand the concept and knowledge of management of technology.
- 2) Able to understand and use the real options analysis.
- 3) Able to apply and propose original technological management methods.

Shibusawa

Advanced Urban and Regional Economics

Advanced Economic Simulation Model

Policy Evaluation Methodology

Evaluation of achievement

Fujiwara

Evaluation method: Scoring is based on reports .

Evaluation criteria: A: 80 or higher, B: 65 or higher, C: 55 or higher (Maximum scoring 100).

Shibusawa

Policy evaluation reports must be submitted.

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

Examination

By Report

Details of examination

Other information

Fujiwara

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

Shibusawa

Office#: B-409, Phone#: 6963, e-mail: hiro-shibu@tut.jp

Reference URL

Office hours

Fujiwara

Anytime if available.

Shibusawa

Tuesday 10:00-12:00

Relations to attainment objectives of learning and education

Key words

Real Options, Game Theory, & Technological Entrepreneurship

(D55030130)Advanced Western Culture[Advanced Western Culture]

Subject name[English]	Advanced Western Culture[Advanced Western Culture]				
Schedule number	D55030130	Subject area	Advanced Architecture and Civil Engineering	Required or elective	Elective
Time of starting a course	Spring term	Day of the week,period	Fri.2~2	Credit(s)	2
Faculty	Graduate Program for Doctoral Degree			Subject grade	1~
Department Offered	Architecture and Civil Engineering			Begging grade	D1
Charge teacher name[Roman alphabet mark]	相京 邦宏 AIKYO Kunihiro				
Numbering					
Objectives of class					
Research on a history of scientific ideas in the ancient world. Research on a history of scientific ideas in the ancient world.					
Contents of class					
Lecture on a view of nature and science in the ancient world. Modern science and ancient 'science'. What are similarities or differences between the two?					
Program of lecture					
1. Orientation (outline of the lecture)					
2. Purpose of the Series					
3. Science in Antiquity?					
4. Modern Science 1					
5. Modern Science 2					
6. History and Philosophy					
7. Building Histories 1					
8. Building Histories 2					
9. Building Histories 3					
10. Intellectual Paternities 1					
11. Intellectual Paternities 2					
12. Selective Survival of Texts					
13. Resources for History 1					
14. Resources for History 2					
15. Summary of the lecture					
Lecture on a view of nature and science in the ancient world. Modern science and ancient 'science'. What are similarities or differences between the two?					
Program of lecture					
1. Orientation (outline of the lecture)					
2. Purpose of the Series					
3. Science in Antiquity?					
4. Modern Science 1					
5. Modern Science 2					
6. History and Philosophy					
7. Building Histories 1					
8. Building Histories 2					
9. Building Histories 3					
10. Intellectual Paternities 1					
11. Intellectual Paternities 2					
12. Selective Survival of Texts					
13. Resources for History 1					
14. Resources for History 2					
15. Summary of the lecture					
Self Preparation and Review					

Preparation & review of text
Preparation & review of text

Related subjects

Notes for textbook

Notes for reference

Roger French, Ancient Natural History. Routledge, 1994.
Roger French, Ancient Natural History. Routledge, 1994.

Goals to be achieved

- (1)A correct perception of a history of science.
 - (2)A comprehensive grasp of the origin of scientific ideas in Western Europe.
 - (3)Understanding of basic terms on a history of science.
 - (4)A correct understanding of a relation between modern science and pre-modern science.
 - (5)A total appreciation of a transition of scientific ideas.
 - (6)A correct understanding of literature on a history of science.
-
- (1)A correct perception of a history of science.
 - (2)A comprehensive grasp of the origin of scientific ideas in Western Europe.
 - (3)Understanding of basic terms on a history of science.
 - (4)A correct understanding of a relation between modern science and pre-modern science.
 - (5)A total appreciation of a transition of scientific ideas.
 - (6)A correct understanding of literature on a history of science.

Evaluation of achievement

Holding the end-of-term exams.
Holding the end-of-term exams.

Examination

レポートで実施
By Report

Details of examination

Other information

Reference URL

Office hours

pm. 1-4(Wednesday)

pm. 1-4(Wednesday)

Relations to attainment objectives of learning and education

建築・都市システム学専攻

- (A) 研究者・技術者としての正しい倫理観と社会性
研究者・技術者としての専門的・倫理的責任を自覚し、人類の幸福・健康・福祉の観点から社会における技術的課題を設定・解決・評価する能力
- (B) 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
- (C) 広範囲の知識を有機的に連携させた研究開発能力
広範囲の知識の連携による研究開発に対する方法論を体得し、研究開発の計画立案と、それを実践できる能力
- (D) 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

Key words

ancient, science, history

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