SYLLABUS *2011*

[D] Advanced Engineering Course Program (5yr Course)

Kyoto University, Graduate School of Engineering

[D] Advanced Engineering Course Program (5yr Course)

Civiland Earth Resources Engineering

Urban Management

Urbanand Environmental Engineering

Mechanical and Architectural Engineering

Micro Engineering

Aeronautics and Astronautics

Nuclear Engineering

Materials Science and Engineering

Electrical Engineering

Electronic Science and Engineering

Material Chemistry

Energy and Hydrocarbon Chemistry

Molecular Engineering

Polymer Chemistry

Synthetic Chemistry and Biological Chemistry

Chemical Engineering

10F251

Exercise on Project Planning

自主企画プロジェクト

【Code】10F251 【Course Year】Master 1st 【Term】1st+2nd term

【Class day & Period】1st term: Thu 3rd, 2nd term: Wed 5th 【Location】C1-192 【Credits】2

【Restriction】No Restriction 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】Related instructors

【Course Description】The purpose of this seminar is to bring out the self-initiative, the planning ability, the creativity of students. From project and to practice, the students set up the goals of projects, go ahead with the projects by themselves, and finally make the presentations of project results. Specifically, about the internship activities in enterprises, the training activities in enterprises or universities at home and abroad, the planning and operation of collaborative projects with citizen, the student makes the perfect plannings including the purposes, the ways, the results and so on. For a final, the students do practice, they write the reports and make the presentations about the project results.

【Grading】Planning, implementation of project and reports are comprehensively evaluated.

【Course Goals】Goals are cultivating ability for self-initiative, planning and creativity.

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Details are provided in the first lecture.

10U055

Seminar on Infrastructure Engineering A

社会基盤工学セミナー A

【Code】10U055 【Course Year】Master 1st 【Term】1st+2nd term

【Class day & Period】1st term: Wed&Fri 5th, 2nd term: Mon&Tue 5th 【Location】 【Credits】4 【Restriction】

【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】This lecture focuses on the movement and content of the most advanced research at home and abroad on Infrastructure Engineering. The students are individually instructed about the planning of study schedule , the way of collecting datas, the way of doing the research and summarizing the results of research.

【Grading】Points are allocated for research activities such as a presentation at laboratory seminars, domestic conferences, international conferences, research paper presentation etc. Students are required to obtain the points in total which are more than predefined points.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10U056

Seminar on Infrastructure Engineering B

社会基盤工学セミナー B

【Code】10U056 【Course Year】Master 1st 【Term】1st+2nd term

【Class day & Period】1st term: Thu 5th & Fri 4th, 2nd term: Thu 4th & Fri 5th 【Location】 【Credits】4

【Restriction】 【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】Related instructors

【Course Description】The students make the collection of datas, study and summarize the research results about the specific themes on Infrastructure Engineering. In addition, the students are individually instructed about the way of presentation of research results through the presentations at the conferences at home and abroad, the ones at laboratory and participation in training course.

【Grading】Points are allocated for research activities such as a presentation at laboratory seminars, domestic conferences, international conferences, research paper presentation etc. Students are required to obtain the points in total which are more than predefined points.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F063

Practice in Infrastructure Engineering

社会基盤工学実習

【Code】10F063 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 1st

【Location】C1-173 【Credits】2 【Restriction】 【Lecture Form(s)】Seminar 【Language】Japanese

【Instructor】Related instructors

【Course Description】The purpose of this seminar is to develop the student's fundamental understanding into the applied understsnding about the various types of techniques on Infrastructure Engineering. By taking the applied practical programs of shared major classes under the instructions of teachers in charge, and participating in the practical programs offered by some organizations and associations outside the university, the students can improve the ability of resolving some problems on Infrastructure Engineering. These are limited to the programs certified as the department.

【Grading】Attendance and report are comprehensively evaluated.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F003

Continuum Mechanics

連続体力学

【Code】10F003 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Mon 2nd 【Location】C1-192
【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese
【Instructor】Kunitomo Sugiura, Tomomi Yagi
【Course Description】Continuum mechanics is a unified basis for solid mechanics and fluid mechanics. The aims of this course are to introduce the continuum mechanics from their basics to the some forms of constitutive law and also to provide students with mathematical way of understanding the continuum mechanics. This course contains the fundamentals of vector and tensor calculus, the basic equations of continuum mechanics, the tensor expressions of elastic problems and further applications.
【Grading】Assessment will be based on exam, report and attendance.
【Course Goals】Fundamental theorems on structural mechanics and design will be learned, and ability to judge the proprieties of each computational structural analysis will be acquired.
【Course Topics】

Theme	Class number of times	Description
Introductions	1	
Matrices and tensors	1	
differential and integral calculus of tensors	1	
Kinematics	1	- Material derivative
Deformation and strain	2	- Strain tensors - Compatibility conditions
Stress and equilibrium equation	1	
Conservation law and governing equation	1	
Constitutive equation of idealized material	1	
Elastic-plastic behavior and constitutive equation of construction materials	1	
Boundary value problem	1	
Variational principle	1	
Various kinds of numerical analyses	2	

【Textbook】
【Textbook(supplemental)】
【Prerequisite(s)】Basic knowledge for structural mechanics, soil mechanics and fluid mechanics are required.
【Web Sites】
【Additional Information】

10F067

Structural Stability

構造安定論

【Code】10F067 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】C1-171 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Shirato, H. and Sugiura, K.

【Course Description】Discussed in the class are stability/instability of large structural systems and improvement of their safety and performance. The aim of this course is to provide details of structural stability under static and dynamic loading, and technical issues to improve the safety of structures. In addition, typical examples in the practice in structural design are also provided.

【Grading】Assessment will be based on exam, reports and attendance.

【Course Goals】The basic knowledge for structural stability under static and dynamic loading, which are necessary for the structural design of bridges, will be acquired.

【Course Topics】

Theme	Class number of times	Description
Elastic Stability under Static Loading	7	Stability of Structures and Failures Basis of Structural Stability Elastic Buckling of Coulmns Elastic Buckling of Beams & Frames Elastic Buckling of Plates Elasto-plastic Buckling Buckling Analysis
Structural Stability under Dynamic Loading	7	Introduction of Wind-induced Vibration Nonlinear Response due to Wind and Its Stability Discriminant: Part 1 Nonlinear Response due to Wind and Its Stability Discriminant: Part 2 Nonlinear Response due to Wind and Its Stability Discriminant: Part 3 Nonlinear Response due to Wind and Its Stability Discriminant: Part 4 Wind-induced Response Analysis of Long Span Bridges: Flutter Analysis Wind-induced Response Analysis of Long Span Bridges:Buffeting Analysis
Achievement Check	1	Summary and Achievement Check

【Textbook】not specified

【Textbook(supplemental)】Introduced in class if necessary

【Prerequisite(s)】Basic knowledge for structural mechanics, continuum mechanics and structural analysis are required.

【Web Sites】

【Additional Information】

10F068

Material and Structural System & Management

材料・構造マネジメント論

【Code】10F068 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd 【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】Toyoaki Miyagawa, Hirotaka Kawano, Atsushi Hattori, Takashi Yamamoto

【Course Description】Microscopic structures of various construction materials are introduced. Theoretical and experimental examination on their effects on various engineering properties are explained. With major view on steel and concrete, their engineering properties are introduced to discuss influences of the properties on mechanical and durability performances of concrete structures subjected to steel corrosion and alkali-aggregate reaction. In addition, management of infrastructures are lectured with the software aspects required in economy, environment, education as well as with maintenance based on hardware techniques.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
1. Properties and performances of concrete, materials and structures	2	
2. Outline of maintenance of structures	2	
3. Maintenance of structures - deterioration predictions, evaluation and judgement	2	
4. Maintenance of structures - remedial actions - repair and strengthening	2	
5. Presentations and discussions	3	
6. Structures Management	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F261

Earthquake Engineering/Lifeline Engineering

地震・ライフライン工学

【Code】10F261 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 4th

【Location】C1-191 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Kiyono, Koike, Igarashi

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	1	
	1	
	1	
Principles of seismic design of structures	2	
Seismic performance of concrete and steel structures	1	
Seismic isolation and structural control	1	
Seismic retrofit and rehabilitation of structures	1	
	1	
	2	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10W001

Infrastructural Structure Engineering

社会基盤構造工学

【Code】10W001 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 2nd 【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】

【Course Description】Structural engineering problems related to planning, design, construction and maintenance of the infrastructures are discussed. Topics concerning structural engineering and management are widelly taken up including latest advanced knowledge and technology, future view and/or international topics. Special lectures by extramural lecturers are carried out if necessary.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	4	
	2	
	5	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F009

Structural Design

構造デザイン

【Code】10F009 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Fri 2nd
【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese
【Instructor】Tomoaki Utsunomiya, Yoshikazu Takahashi, Yoshiaki Kubota
【Course Description】This course provides the knowledge of the structural planning and design for civil infrastructures. Fundamentals of the reliability of structures based on the probability and statistics are given. Emphasis is placed on the reliability index and the calibration of partial safety factors in the LRFD design format. Furthermore, the structural morphology, aesthetics and case studies of structural design that satisfies “utilitas, firmitas and venustas” are given. Then we discuss what the holistic structural design should be.
【Grading】Assessed by term-end examination, reports and quizes
【Course Goals】To understand the structural planning and design for civil infrastructures.
To understand the reliability-based design of structures.
To deepen the understanding of aesthetics of structures.
【Course Topics】

Theme	Class number of times	Description
Structural Planning	2	Structural Planning of civil infrastructures is introduced. The concept, significance of planning, characteristics of civil infrastructures are discussed. Practical planning process of a bridge is explained.
Modern Excellent Designs	1	The excellent examples of modern structural design are introduced from the viewpoint of the structural system and the urban design. Then the importance of integrated design of urban infrastructure as a place of human activities and how the design should be are lectured.
Structure and Form	2	The bridge types, for example, girder, truss, and arch etc. that have been regarded individually, are lectured as an integrated holistic concept from the viewpoint of the acting forces to understand the structural continuity, symmetry and the systems. Furthermore, the methods of the operation of structural form are given.
Structural Design and Performance-based Design	3	Design theory of civil infrastructures is introduced. The allowable stress design method and the limit state design method are explained. The basic of earthquake resistant design is discussed based on the dynamic response of structures. Performance-based design is also introduced.
Random Variables and Functions of Random Variables	1	Fundamentals of random variables, functions of random variables, probability of failure and reliability index in their simplest forms are lectured.
Structural Safety Analysis	3	Limit states, probability of failure, FOSM reliability index, Hasofer-Lind reliability index, Monte Carlo method are lectured.
Design Codes	2	Code format as Load and Resistance Factors Design (LRFD) method, calibration of partial safety factors based on the reliability method are given.

【Textbook】Reliability of Structures, A. S. Nowak & K. R. Collins, McGraw-Hill, 2000 (for T. Utsunomiya)
【Textbook(supplemental)】U.Baus, M.Schleich, "Footbridges", Birkhauser, 2008（Japanese ver.: "Footbridges"(translated by Kubota, et al.), 鹿島出版会 , 2011）
久保田善明 , 『橋のディテール図鑑』, 鹿島出版会 , 2010
Other books will be given in the lectures as necessary.
【Prerequisite(s)】Fundamental knowledge on Probability and Statistics, and Structural Mechanics
【Web Sites】https://www.t.kyoto-u.ac.jp/lecturenotes
【Additional Information】Structural planning and design will be given by Y. Takahashi, Excellent designs and structure & forms by Y. Kubota, and Structural reliability analysis by T. Utsunomiya.

10F010

Bridge Engineering

橋梁工学

【Code】10F010 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Mon 3rd 【Location】C1-117 【Credits】2

【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Hiromichi Shirato, Kunitomo Sugiura, Tomoaki Utsunomiya, Tomomi Yagi

【Course Description】The subject matter of bridge engineering can be divided into two main parts, which are steel structure and wind loading/wind resistant structure. The aim of this course is to provide details of mechanical behaviors, maintenance and design of bridge structures. The former part of this course contains the static instability of steel structures and the problems of corrosion、fatigue、brittleness、weldability on steel bridges. In the latter part, the basics of wind engineering, bridge aerodynamics and wind-resistant design including current problems to be solved are provided are provided.

【Grading】Assessment will be based on exam, reports and attendance.

【Course Goals】

Also, the basic knowledge for wind engineering and aerodynamic instabilities, which are necessary for the wind resistant design of bridges, will be acquired.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	- Fundamental knowledge on steel structures - Types of steel structures - Future trend of steel structures
Material behavior, Initial imperfections and Damages	1	- Construction of steel structures - Residual stresses and initial deformations - Damages
Stress-strain relationship, Joints	1	- Yield surfaces - Bauschinger effect - Hardening effect - Welded joint - Bolted joint
Fatigue fracture, fatigue life and fatigue design	1	- S-N design curve - Fatigue crack growth, stress intensity factor - Miner's rule on damage accumulation - Repair of fatigue damage
Structural stability and design for buckling	1	- Structural instability and accident - Theory of Stability - Compressive members, etc.
Corrosion and anti-corrosion of steel structures	1	- Mechanism of corrosion - Micro- and Macro- cells - Anti-corrsion - Life-cycle costs
Wind resistant design of structures	2	- Natural winds due to Typhoon, Tornado and so on - Evaluation and estimation of strong winds - Wind resistant design methods - Various kinds of design codes
Aerodynamic instabilities of structures	3	- Introduction of aerodynamic instabilities (ex. vortex-induced vibration, galloping, flutter, buffeting, cable vibrations) - Mechanisms of aerodynamic instabilities - Evaluation methods and Countermeasures
Wind-induced disaster	1	- Accidents on structures due to strong winds - Disaster prevention
Topics	1	Introduction of current topics on bridge engineering by a visiting lecturer

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Basic knowledge for construction materials, structural mechanics and fluid mechanics are required.

【Web Sites】

【Additional Information】

10A019

Concrete Structural Engineering

コンクリート構造工学

【Code】10A019 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Tue 2nd

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Toyoaki Miyagawa, Takashi Yamamoto, Kei Murota (Sumitomo Mitsui Construction Co., LTD.)

【Course Description】Concrete is one of the most useful construction materials employed for an infrastructure. The structural properties of a reinforced concrete including a prestressed concrete are introduced among the various structural components of concrete. The engineering techniques in design, execution, diagnosis, repair, strengthening and management of reinforced and/or prestressed concrete structures are discussed from the point of view of the performance based system.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	5	
	5	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F227

Structural Dynamics

構造ダイナミクス

【Code】10F227 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 1st

【Location】C1-117 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Igarashi, Furukawa

【Course Description】This course deals with dynamics of structural systems and related topics, to provide the theoretical basis to deal with the problems of vibration, safety under dynamic loads and health monitoring associated with infrastructures. The students will study the dynamic response, properties of natural modes and methods of eigenvalue analysis for multi-DOF systems. The topics on the numerical time integration schemes, probabilistic evaluation of structural response to random excitation, and dynamic response control techniques for structures are also studied.

【Grading】Based on the results of a final examination, plus homework assignments

【Course Goals】(1) To aquire the knowledge on theories and principles of analysis of MDOF systems (2) Systematic understanding of frequency-domain structural response analysis

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Fudamental concepts, harmonic motion
Dynamics of Multi-Degree-Of-Freedom Systems	2	Formulation of Eq. of Motion / Lagrange's method / Normal Modes / Modal Analysis / Modeling of System Damping
Frequency-Domain Analysis of System Response	1	Frequency Response Funcs. / Fourier Transform
Numerical Time Integration	2	Formulation / Stability and Accuracy Analysis of Integration
Random Vibration	6	Overview / Probability Theory / Sequence of i.i.d. Random Variables / Concept of Random Processes / Correlation Funcs. / White Noise / Stochastic Differential Eq. / Lyapunov Eq. / Response to White Noise Excitation / Covariance Matrix Approach / Correlation Funcs. of Random Response / Spectral Representation of Random Processes / Spectral Representation of Structural Response / Application
Structural Response Control	1	Active Control / Semi-Active Control

【Textbook】Not used; Class hand-outs are distributed when necessary.

【Textbook(supplemental)】

【Prerequisite(s)】Mechanical vibration (undergraduate level), Complex calculus (integration of analytic functions, Fourier transform, etc.), Probability theory, Linear algebra

【Web Sites】https://www.t.kyoto-u.ac.jp/lecturenotes/gse/dum/dum002/

【Additional Information】

10F263

Seismic Engineering Exercise

サイスミックシミュレーション

【Code】10F263 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 4th 【Location】C1-192 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture and Exercise 【Language】Japanese 【Instructor】Sawada, Takahashi

【Course Description】This course provides the knowledge of simulation methods for earthquake engineering. Small groups of students are exercised in the prediction of ground motion generated by a specified seismic fault and the response analysis of structure selected by themselves considering soil-structure interaction.

【Grading】Based on the performance during the course (including homework) and the results of presentation and reports.

【Course Goals】At the end of this course, students will be required to have a good understanding of: - Prediction of ground motion generated by a specified seismic fault - Dynamic response analysis of structures and foundation (linear/nonlinear)

【Course Topics】

Theme	Class number of times	Description
Frequency domain analysis	1	Basics of Fourier transformation is introduced.
Modeling of structure - soil system and time domain analysis	1	Equation of motion of SR model is introduced and the integration method of the equation in time domain is explained.
Exercise of linear seismic response analysis	2	Small groups of students are exercised in elastic modeling of structures and linear response analysis in time domain and frequency domain.
Prediction of ground motion by empirical Green's function method	3	Empirical Green's function method is introduced to predict large earthquakes based on observed small earthquakes.
Seismic analysis method of soil	2	Seismic analysis method of layered half-space based on equivalent linearization method is introduced.
Nonlinear seismic analysis method of structures	2	Nonlinear modeling of structures and the integration and iterative methods of the nonlinear equation of motion in time domain are introduced.
Exercise of nonlinear seismic response analysis	3	Small groups of students are exercised in the prediction of ground motion generated by a specified seismic fault and the nonlinear response analysis of structures and foundation.

【Textbook】Not used; Class hand-outs are distributed when necessary.

【Textbook(supplemental)】

【Prerequisite(s)】Earthquake Engineering/Lifeline Engineering (10F261), Structural Dynamics (10F227)

【Web Sites】

【Additional Information】

10F415

Ecomaterial and Environment-friendly Structures

環境材料設計学

【Code】10F415 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 1st

【Location】C1-117 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Hirotaka Kawano, Atsushi HATTORI

【Course Description】Lecture on outline of impact of construntion materials to environment and influence on materials and structures from environment. Discuss how to use materials sustainably. Keywords are concrete, steel, composite materials, CO2, durability, recycle and reuse, life-cycle assessment.

【Grading】Attendance(%), Report(%),Presentation(%)

【Course Goals】To understand the limit of resources and effect of material use to environment. and to understand the basic theory to make environmental-friendly infrastructures from the view point of materials use.

【Course Topics】

Theme	Class number of times	Description
Guidance	1	Object of the Course, Grading and Goals
product of materials and impact to environment	1	Product of cement, steel, concrete CO2 product and its influence
recycle and reuse of materials	3	Recycle and reuse of steel, metals, concrete, asphalt, plastics Technology development of construction materials
deterioration of concrete structures	1	Mechanism of deterioration of concrete structures: carbonation, salt attack, alkali-aggregate reaction Maintenance and retrofit methods
deterioration of steel structures	1	Mechanism of deterioration of steel structures: corrosion, fatigue Maintenance and retrofit methods
deterioration of composite structures	1	Mechanism of deterioration of composite structures: Maintenance and retrofit methods
life-cycle assessment of structures	1	Life-cycle assessment of structures considering initial cost as well as maintenance cost
topics and discussion	2	Recent topics on construction materials and discussion
presentation by students and discussion	4	Presentation by students on the individual topics Discussion on the topics

【Textbook】No set text

【Textbook(supplemental)】Instructed in class

【Prerequisite(s)】Basic knowledge of construction materials, concrete engineering

【Web Sites】

【Additional Information】Questions and discusions are welcome

10F089

Infrastructure Safety Engineering

社会基盤安全工学

【Code】10F089 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Thu 3rd

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】To introduce students to the issues concerning the safety and reliability of infrastructures such as tunnels and bridges

【Grading】This lecture involves reports (70%) and attendance(30%)

【Course Goals】To understand the basic technologies to enhance the safety of structures. To have basic knowledge on safety engineering and be able to evaluate the safety using the obtained skills.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	
Safety of infrastructures	3	
Basics of safety engineering 1	2	
Basics of safety engineering 2	2	
Risk analysis and reliability	3	
Monitoring and safety evaluation	1	
safety of geo-structures	1	
safety of bridges	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Basic knowledge on statistics is required. Students should have taken the course of geo-mechanics, structural mechanics and concrete engineering.

【Web Sites】

【Additional Information】confirm the attendance at every lecture

10F075

Hydraulics & Turbulence Mechanics

水理乱流力学

【Code】10F075 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 3rd

【Location】C1-171 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】,

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】Nezu, I. and Nakagawa, H. : Turbulence in Open-Channel Flows, Balkema,

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A216

Hydrology

水文学

【Code】10A216 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 2nd 【Location】C1-172
【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese
【Instructor】Michiharu SHIIBA and Yasuto TACHIKAWA
【Course Description】Physical mechanisms of the hydrologic cycle are described from the engineering viewpoint. The rainfall-runoff modeling and its prediction method are emphasized. Physical hydrological processes explored are surface flow, saturated-unsaturated subsurface flow, groundwater flow, streamflow routing, and evapotranspiration. Physical mechanism of each hydrological process and its numerical modeling method are explained, and the basic equations and numerical simulation methods are provided. Then, distributed hydrological modeling which incorporate various hydrological processes and a lumping method of distributed hydrological model are explained.
【Grading】Examination and report
【Course Goals】The goals of the class are to understand the physical mechanism of hydrological processes, their basic equations, and numerical simulation methods.
【Course Topics】

Theme	Class number of times	Description
Introduction	1	The hydrologic cycle and the hydrological processes are explained.
Surfaceflow	2	The physical process of the surface flow and its numerical modeling method are described. The basic equations of the surface flow and the numerical simulation methods are explained.
Saturated-unsaturated subsurface flow	2	The physical process of the saturated-unsaturated subsurface flow and its numerical modeling method are described. The basic equations of the saturated-unsaturated subsurface flow and the numerical simulation methods are explained.
Groundwater flow	2	The physical process of the groundwater flow and its numerical modeling method are described. The basic equations of the groundwater flow and the numerical simulation methods are explained.
Streamflow routing	2	The physical process of the streamflow routing and its numerical modeling method are described. The basic equations of the streamflow routing and the numerical simulation methods are explained.
Evapotranspiration	2	The physical process of the evapotranspiration and its numerical modeling method are described. The basic equations of the evapotranspiration and the numerical simulation methods are explained.
Channel network and watershed modeling	1	Numerical representations of channel networks and catchments are explained.
Distributed hydrological model	1	A physically-based distributed hydrological model is described, which is constructed with numerical representations of channel networks and catchments.
Lumping of flow, parameter and watershed model	1	Lumping methods of a distributed hydrological model are described, which include lumping of flow, parameter and watershed model.

【Textbook】Handouts are distributed at each class.
【Textbook(supplemental)】
【Prerequisite(s)】Basic knowledge of hydraulics and hydrology
【Web Sites】http://hywr.kuciv.kyoto-u.ac.jp/lecture/lecture.html
【Additional Information】

10F019

River Engineering and River Basin Management

河川マネジメント工学

【Code】10F019 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 1st 【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Hosoda, Kishida

【Course Description】It is important to consider about rivers comprehensively in view of the various aspects based on natural science and engineering. The fundamental knowledge to consider rivers and make the plans of river basins is explained with the following contents: various view points to consider rivers, long term environmental changes of rivers and its main factors, river flows and river channel processes, ecological system of rivers and lakes, flood disasters, integrated river basin planning(flood defence, environmental improvement planning, sediment transport system), functions of dam reservoir and management

【Grading】reports, attendance

【Course Goals】to learn the fundamental knowledge and grounding to consider rivers from the various points of view such as natural science, engineering and social science.

【Course Topics】

Theme	Class number of times	Description
Various view points on rivers and river basins	1	Various viewpoints and river basins, Various rivers on the earth, Formation processes of river basins, long term environmental changes of rivers and its main factors
Ecological system in rivers	1 ～ 2	Fundamental knowledge on river eco-system
Application of computatinal methods to environmental problems	2	Numerical analysis of the environmental change in Lake Biwa, Flood flows and river channel processes
Recent flood disasters & Integrated river basin planning	2	Characteristics of recent flood disasters, River law, Fundamental river management plan, River improvement plan, Procedures of flood defense planning, Flood invasion analysis and hazard map
Groundwater and its related field	2	Simulation technology of groundwater, Geo environmental issues, Reservoir Engineering, Contaminant Transport Processes
Sustainable development of dam	2	Needs of dam development and history of dam construction
Water quality of reservoir	1	Environmental fluid behavior on reservoir, Water quality and its maintenance of reservoir
Economic evaluation of environmental improvement projects	1	Evaluation of people's consciousness for river improvement works by means of CVM, Conjoint Analysis, etc.
Dam structure and maintenace	1	Dam structure, foundation, grouting, and maintenance
Special Lecture	1-2	Expert engineer and/or office on the river Engineering and river basin management will be invited.

【Textbook】Printed materials regarding the contents of this class are distributed in class.

【Textbook(supplemental)】

【Prerequisite(s)】Fundamental knowledge of Hydraulics, Hydrology and Ecology

【Web Sites】

【Additional Information】Students can contact with professors by visiting their rooms and sending e-mail.

10A040

Sediment Hydraulics

流砂水理学

【Code】10A040 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 2nd
【Location】C1-171 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese
【Instructor】Hitoshi Gotoh and Eiji Harada

【Course Description】Natural flows in river and coast are movable bed phenomena with the interaction of flow and sediment. At a river and a coast, a current and a wave activate a sediment transport and bring the topographical change of a bed such as sedimentation or erosion. This lecture provides an outline about the basics of sediment (or movable bed) hydraulics, and detail of the computational mechanics of sediment transport, which has been developed on the basis of dynamics of flow and sediment by introducing a multiphase flow model and a granular material model. Furthermore, about sediment and water-environment relationship, some of frontier technologies, such as an artificial flood, removal works of dam sedimentation, coastal protection works, and sand upwelling work for covering contaminated sludge on flow bottom etc., are mentioned.

【Grading】Grading is based on student’s activities in lectures and final reports.

【Course Goals】Students understand the basics of sediment hydraulics and outline of advanced models for computational sediment hydraulics, such as multiphase flow model and granular material model. Students understand the present conditions of sediment control works.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	The purpose and constitution of the lecture, the method of the scholastic evaluation are explained.
Basics of sediment hydraulics	4	Physical characteristic of a movable bed and a non-equilibrium sediment transport process and its description are explained. Furthermore, the prediction technique of topographical change due to current and waves is outlined.
Computational mechanics of sediment transport: The state of the art	7	Essential parts of numerical models of the movable bed phenomena, which has been developed by introducing dynamic models such as a granular material model to describe a collision of sediment particles and a multiphase flow model to describe a fluid-sediment interaction, are described. In comparison with the conventional movable bed computation, the points on which has been improved to enhance the applicability of the models are concretely mentioned. Some frontier studies of sediment transport mechanics are also introduced.
Planning and management of movable bed flows	1	The concept of new Japanese Seacoast Law is explained. New works of coastal protection with consideration of an environmental aspect (including improvement of habitat of coastal creatures) are mentioned with focusing physics behind them.

【Textbook】Hitoshi Gotoh: Computational Mechanics of Sediment Transport, Morikita Shuppan Co., Ltd., p.223, 2004 (in Japanese).

【Textbook(supplemental)】Non

【Prerequisite(s)】Undergraduate-level Hydraulics or Hydrodynamics is required. Because a commentary easy as possible is kept in mind by lectures, students without these prerequisite are welcomed.

【Web Sites】Non

【Additional Information】Non

10F462

Coastal Wave Dynamics

海岸波動論

【Code】10F462 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Hitoshi Gotoh, Eiji Harada, Khayyer Abbas and Kazuya Oki

【Course Description】Wave motion, which is the main driving force in coastal zone, is explained focusing on wave transformation theory and computational fluid dynamics, and design for coastal structures of their engineering applications is illustrated. As for the computational fluid dynamics for waves, methodology of free-surface wave based on the Navier-Stokes equation, which has been significantly developed in recent years, is explained in detail.

【Grading】Grading is based on usual students activities in lectures and reports.

【Course Goals】Goal of this course is a detailed understanding of fundamental of wave transformation theory and computational fluid dynamics related to wave motion, and is also acquiring a design concept for coastal structures as their engineering applications.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	The purpose and constitution of the lecture the method of the scholastic evaluation are explained.
Conservation laws of fluid	1-4	Fundamentals of fluid mechanics, liner / non-liner wave theories and numerical mathematics are explained.
Modeling of surf zone dynamics	1-7	Several methodologies against free-surface wave including breaking waves (i.e. VOF, MPS, SPH) are illustrated. Especially advanced approaches of MPS and SPH are explained in detail.
Introduction of turbulence models	1	Reynolds averaging models and large eddy simulation are outlined.
Modeling of rock mound dynamics	1-2	Method for tracking of armor blocks under high waves using Distinct Element Method is described.

【Textbook】Non

【Textbook(supplemental)】Non

【Prerequisite(s)】Non. It is desiarable to have knowledge about hydraulics, fluid mechanics.

【Web Sites】

【Additional Information】If there are any questions, please send e-mail to the staff.

10F267

Hydro-Meteorologically Based Disaster Prevention

水文気象防災学

【Code】10F267 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Mon 4th

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	1	
	2	
	2	
	2	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A222

Water Resources Systems

水資源システム論

【Code】10A222 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd 【Location】C1-192 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	1	
	1	
	2	
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F077

River basin management of flood and sediment

流域治水砂防学

【Code】10F077 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 1st

【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】(DPRI) Nakagawa, H., (DPRI) Sumi, T., (DPRI) Takebayashi, H. and (DPRI) Kawaike, K.

【Course Description】In a river basin, various kinds of disasters such as debris flow, land slide, flood inundation, storm surge, and etc. sometimes happen from the origin to the mouth. This lecture presents occurrence examples, mechanisms, theory and methods of prediction and prevention/mitigation methods against those disasters. Also this lecture mentions comprehensive management in a sediment routing system focusing on sediment management strategy in dam reservoirs.

【Grading】Grading is based on 2 reports out of 4 topics and attendance.

【Course Goals】The goals of the class are to understand phenomena within a river basin and to have wide knowledge of problems of flood and sediment disasters and countermeasures against them.

【Course Topics】

Theme	Class number of times	Description
About Sabo Works	4	About Sabo works, sediment disasters, countermeasures against sediment disasters, Sabo projects.
About Reservoir Sediment Management	3	Reservoir sediment management focusing on reservoir sustainability and comprehensive management in a sediment routing system is overviewed including worldwide perspective and Japanese advanced case studies.
About basin-wide sediment routing	3	About the one dimensional bed deformation analysis and the sediment runoff model are introduced. Furthermore, some examples of the application of those models are introduced.
About basin-wide flood management	4	Flood disasters and countermeasures against them are overviewed along the history of flood management in Japan.

【Textbook】No designation. Printed materials regarding the contents of this class are distributed in class.

【Textbook(supplemental)】Instructed in class

【Prerequisite(s)】Fundamental knowledge of Hydraulics and river engineering

【Web Sites】

【Additional Information】

10F011

Computational Fluid Dynamics

数値流体力学

【Code】10F011 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 4th 【Location】【Credits】2【Restriction】No Restriction【Lecture Form(s)】Lecture【Language】English【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	6	
	6	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F065

Hydraulic Engineering for Infrastructure Development and Management

水域社会基盤学

【Code】10F065 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Tue 3rd

【Location】C1-117 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Nezu Iehisa, Shiiba Michiharu, Hosoda Takashi, Gotoh Hitoshi, Tachikawa Yasuto, Kisihida Kiyoshi, Harada Eiji, Sanjou Michio and Kim Sunmin

【Course Description】This lecture picks up various water-related problems and provides their explanation and solution methodology related to hydrodynamic and hydrological infrastructure improvements, maintenance, disaster prevention against flood and damage of water environment, interweaving several leading-edge cases in the real world. Turbulent flow and CFD, sediment transport system and design/planning of hydraulic structure are described on the basis of the integrated management of river-and-coast systems with sediment control and these relationship with infrastructure improvement. Perspective from the viewpoint of public environmental infrastructure on water environment is presented.

【Grading】Grading is based on students activities in lectures and reports.

【Course Goals】Students learn about case-based practical solutions against various problems related to hydraulic engineering, and students acquire academic preparation of how to approach to public environmental infrastructure on water area.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	The purpose and constitution of the lecture, the method of the scholastic evaluation are explained.
Turbulence phenomena in open-channel flows	3	Several problems and exciting topics related to turbulence phenomena in open-channel flows are discussed with advanced practical examples.
River basin management	3	Introduction of flood disasters during a few decades in the world, flood control planning in Japan, Economic evaluation and analysis of people’s awareness to river improvement projects with dam construction.
Beach erosion	3	Several problems and their solution methodology against sediment transport process in coastal zone are explained. Advanced approaches for sediment control are overviewed.
Rainfall-runoff prediction and hydrologic design	3	Water resources issues related to rainfall-runoff prediction and hydrologic design are discussed with advanced practical examples.

【Textbook】Non

【Textbook(supplemental)】Non

【Prerequisite(s)】hydraulics, fluid mechanics, river engineering, coastal engineering, hydrology, etc.

【Web Sites】Non

【Additional Information】Non

10F100

Applied Hydrology

応用水文学

【Code】10F100 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 4th

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Tohiharu Kojiri, Tomoharu Hori, Tetsuya Sumi, Yoshitaka Kido, Yasuhiro Takemon, Kenji Tanaka

【Course Description】Applied and integrated approach to the problems closely related to the water circulation system, such as floods, droughts, water contamination, ecological change, and social change is introduced mainly from the hydrological viewpoint with reference to water quantity, quality, ecological and socio-economic aspects. In the course, several actual water problems are taken up and solving process of each problem which comprises of problem-identification and formulation, impact assessment, countermeasures design and performance evaluation is learned through the lectures ’ description and also investigation and discussion among the students.

【Grading】Grading is based on student activities in lectures, presentation and reports

【Course Goals】To obtain fundamental Knowledge and skills to perform problem definition, survey amd countermeasure design on problems about water use, water hazard mitigation and water environment.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Target fields and characteristcis of Hydrology and Applied Hydrology
Modeling of hydrologic cycle process	2	Modelking of hydrologic processes and relation to human society
Assessment of climate change effects	2	Impact of global warming and climate change on hydrologic cycle and water use environment
Water resources system	2	interaction between water resources and socio-economic systems, distributed flood risk assesment and countermeasures design from hhuman security viewpoint
Reservoir system and its sustainability	2	Asset management of dam reservoirs for their sustainability, Basinwide sedimant management and reservoir operation
Ground water system	2	Basin scale water quiality analysis, Modeling of ground water system
Ecosystem management	2	Habitat structure assessment for stream ecosystem
Presentation	1	
Report	1	

【Textbook】Printed materials on the contents of this class are distributed in class.

【Textbook(supplemental)】None

【Prerequisite(s)】Elementary knowledge of hydrology and water resources engineering.

【Web Sites】

【Additional Information】

10F103

Case Studies Harmonizing Disaster Management and Environment Conservation

環境防災生存科学

【Code】10F103 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 4th

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture 【Language】English

【Instructor】K. TAKARA(DPRI), H. NAKAGAWA(DPRI), E. NAKAKITA(DPRI), H. MASE(DPRI), N. MORI(DPRI), Y. YAMASHIKI(DPRI)

【Course Description】Environmental impacts by infrastructure for disaster prevention and mitigation are discussed. Introducing various examples of natural disasters, degradation of the environment, and harmonizing disaster management and environmental conservation in the world, this classroom carries on a dialogue about effective measures for reducing negative environmental impacts and serious disasters.

【Grading】Considering both the number of attendances and the score of final test at the end of the semester.

【Course Goals】Conservation of the environment and prevention/mitigation of natural disasters, which are very important for human's survivability, often conflict with each other. This course introduces various examples. Students will learn many examples harmonizing these two issues, and shall consider technical and social countermeasures fitting to the regional characteristics.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Introduction
Disaster due to heavy rainfall -- utilization of weather radar and global climate change	3	Disaster due to heavy rainfall -- utilization of weather radar and global climate change
Flood disaster prevention and the environment	2	Flood disaster prevention and the environment
River environment and disaster management	2	River environment and disaster management
The environment of closed water areas / Atmosphere-ocean climate interaction	2	The environment of closed water areas / Atmosphere-ocean climate interaction
Coastal disasters due to tsunamis and storm surges	2	Coastal disasters due to tsunamis and storm surges
Projection of climate and coastal environmental change	2	Projection of climate and coastal environmental change

【Textbook】No particular textbook for this course. Necessary documents and literature introduction are provided in the class room from time to time.

【Textbook(supplemental)】Some literature would be introduced by professors.

【Prerequisite(s)】No special knowledge and techniques are necessary, but requires reading, writing and discussing in English in the class.

【Web Sites】

【Additional Information】Contact Prof. Takara at <takara.kaoru.7v@kyoto-u.ac.jp> if you have any query.

10F106

Integrated Disasters and Resources Management in Watersheds

流域管理工学

【Code】10F106 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 1st

【Location】Katsura Campus, Ujigawa Open Laboratory, Shirahama Oceanographic Observatory and Hodaka Sedimentation Observatory

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture and Exercise 【Language】English

【Instructor】Keiichi TODA(DPRI), Masaharu FUJITA(DPRI), Tetsuya HIRAISHI(DPRI), Nozomu YONEYAMA(DPRI), Kenji KAWAIKE(DPRI), Hiroshi TAKEBAYASHI(DPRI), Daizo TSUTSUMI(DPRI)

【Course Description】Mechanism and countermeasures of sediment disasters, flood disasters, urban flood disasters and coastal disasters are explained. An integrated watershed management of these disasters and water/sediment resources is also introduced. This lecture will be open at Katsura Campus, Ujigawa Open Laboratory, Shirahama Oceanographic Observatory and Hodaka Sedimentation Observatory. Students attending this lecture must take one of the intensive experiment/field study courses offered in Ujigawa Open Laboratory and these observatories.

【Grading】Presentation, Discussion and Report

【Course Goals】Learn an integrated basin management system for natural disasters (sediment disasters, food disasters, coastal disasters, urban flood disasters) mitigation and water/sediment resources utilization considering environmental conservation.

【Course Topics】

Theme	Class number of times	Description
Urban flood disaster managemnet	2	We review urban floods from the viewpoint of river basins, flood causes, and features, together with the results of recent studies. Based on these studies, we propose comprehensive measures against urban floods, including underground inundations. In addition, we discuss on prediction methods of the tsunami disaster in urban area.
Flood disaster management	2	Prevention / mitigation measures against flood disasters and flood prediction methods are explained as well as examples of recent flood disasters in Japan.
Sediment disaster management	2	Showing the problems on sediment disasters and sediment resources, I explain an integrated sedimnet management system both for sediment disasters and sediment resources.
Coastal disaster management	2	Coastal erosion and tsunami hazard become remarkable in these days in Japanese coast. In a lecture, we discuss on characteristics of such coastal disasters.
Exercise on flood disaster at Ujigawa Open Laboratory (Selective)	集中２日間	Experiment and analysis on debris flows, riverbed variation and flooding at Ujigawa Open Laboratory, Fushimi-ku, Kyoto city.
Exercise on sediment related disaster at Hodaka Sedimentation Observatory (Selective)	集中２日間	The Hodaka Sedimentation Observatory is located at Okuhida region, Gifu Prefecture. In the field exercise, observation methods of rainfall-runoff and sediment movement processes will be explained. Field investigations into several types of erosion control facilities, sediment producing sites, debris flow sites and sediment related disaster sites will be carried out.
Exercise on coastal disaster at Shirahama Oceanographic Observatory (Selective)	集中２日間	The Sirahama Maritime Observatory is located in Wakayama Prefecture. In the lecture, observatory, waves, currents and tide levels monitoring system is demonstrated.

【Textbook】None

【Textbook(supplemental)】None

【Prerequisite(s)】Hydraulics, River Engineering, Coastal Engineering, Sediment Transport Hydraulics

【Web Sites】

【Additional Information】

10F025

Geomechanics

地盤力学

【Code】10F025 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 3rd 【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K016

Computational Geotechnics

計算地盤工学

【Code】10K016 【Course Year】 【Term】2nd term 【Class day & Period】Fri 2nd 【Location】C1-172

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	4	
	2	
	1	
	4	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F057

Principles of Geotechnics

地盤工学原論

【Code】10F057 【Course Year】 【Term】2nd term 【Class day & Period】Thu 1st 【Location】C1-173

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	6	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F237

Management of Geotechnical Infrastructures

ジオマネジメント工学

【Code】10F237 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 4th

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Ohtsu, Kishida, Shiotani

【Course Description】Advanced monitoring and management techniques not only during construction stage but maintenance stage in geo- or rock-infrastructures are lectured systematically.

【Grading】Attendance(10%), Report(30%), Examination(60%)

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Guidance	1	Guidance Introduction of Geo-Asset Management
Geotechnical survey	5	Introduction of geotechnical survey, Geophysical exploration, Inversion technique, Practical works of field measurements
Probability theory	4	B/C on project, Project risk management, Basic of probability theory, Introduction of contract and Int'l construction project
Innovative monitoring techniques	4	Applications of geo and rock monitoring, Advanced NDT, Applications of cutting-edge fields

【Textbook】Hiroyasu Ohtsu, Project Management, Corona Publishing, 2010. (in Japanese)

【Textbook(supplemental)】C. Chapman and S. Ward, Project Risk Management, John Wiley & Sons, 1997.
R. Flanagan and G. Norman, Risk Management and Construction, Blackwell Science
V.M. Malhotra & N.J. Carino, CRC Handbook on Nondestructive Testing of Concrete, CRC Press, 1989.

【Prerequisite(s)】

【Web Sites】

【Additional Information】Addtional information is available by visiting the following professors. Appointment shall be made in advance by e-mail.
Ohtsu@toshi.kuciv.kyoto-u.ac.jp
kishida.kiyoshi.3r@kyoto-u.ac.jp
shiotani.tomoki.2v@kyoto-u.ac.jp

10F241

Construction of Geotechnical Infrastructures

ジオコンストラクション

【Code】10F241 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Fri 1st

【Location】C1-171 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Kimura, Kishida

【Course Description】Advanced construction technology of geo infrastructures, such as tunnel, large underground cavern, foundation, culvert, retaining wall, is introduced and explained. And, the practical projects applied by the advanced construction technology are also introduced.

【Grading】Attendace (20%), Report (80%)

【Course Goals】To learn to the advanced construction technology and to propose the project and design through the advanced construction technology.

【Course Topics】

Theme	Class number of times	Description
Guidance, Introduction of construction of geotechnical infrastructures	1	Guidance, Introduction of construction of geotechnical infrastructures
Underground cavern	2	Stability of underground cavern,
Auxiliary mthods of mountain tunnel	2	Role of auxiliary methods, Auxiliary method for safety in tunnel constrcution, Axiliary methods for preservation of the surrounding environment
Undergorund space project	2	Introduce two special projects of underground space, namely, nuclear waste disposal, and Carbon Capture and Storage
Field visit or special lecture	1	Visit the construction field or invite special lecture who is the expert engieer on the construction of geotechnical infrastructures.
Foundation	2	Design and construction of piles foundation and steel pipe sheet piles
Culvert	2	Design and construction of box type and arch type culverts
Retaining wall	2	Design and construction of retaining wall

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Soil mechanics, Rock mechanics

【Web Sites】

【Additional Information】Office hour will be explained at the guidence. Students can contact with professors as an e-mail. kimura@icc.kyoto-u.ac.jp kishida.kiyoshi.3r@kyoto-u.ac.jp

10F242

Geo-Risk Engineering

ジオリスクエンジニアリング

【Code】10F242 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 3rd

【Location】 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Ohtsu, Shiotani, Kishida

【Course Description】This lecture aims to provide interdisciplinary knowledge associated with geo-risk engineering, the topics of risk analysis focusing on geotechnical structures. In detail, the contents of lectures consist of following topics: Introduction of risk analysis, Mathematical background of geo-risk evaluation, Examples of risk evaluation mainly focusing on slopes and Risk management on road slopes.

【Grading】Participation (10), Presentation (50), Report (40)

【Course Goals】Acquire the necessary knowledge of risk engineering to construct and maintain infrastructures.

【Course Topics】

Theme	Class number of times	Description
Guidance	1	Guidance & Introduction
Geo-risk	9	Basic Concept of Geo-Risk Engineering Introduction of Risk Analysis Mathematical Background of Geo-Risk Evaluation Basic Concept of Road Infrastructure Risk Evaluation Management from Macroscopic Viewpoint Management from Microscopic Viewpoint Slope failure early warning system
Risk assessment	2	Case studies of Risk Based Assessment Management by Means of Risk Assessment
Risk for underground structures	2	Risk Management of underground sequestration of Radioactive waste and anthropogenic CO2

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Addtional information is available by the following lecturer. To meet the lecturer, appointment shall be made in advance.

Prof. Hiroyasu Ohtsu
email: ohtsu@toshi.kuciv.kyoto-u.ac.jp

10F405

Fundamental Geofront Engineering

ジオフロント工学原論

【Code】10F405 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 2nd 【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】S.Nishiyama,T.Koyama,K.Ando,T.Takemoto

【Course Description】This lecture aims to learn a practical knowledge associated with mechanical and hydraulic problems in rock masses to realize environment-friendly development of underground space through exercise in modelling and analytical study of rock mass.

【Grading】Problem sets will be given almost every week and due one week later in class. You can work together but must turn in your own solutions.

【Course Goals】This course is designed to give students knowledge and understanding to recognise and apply the fundamental techniques used in engineering rock mechanics for the analysis of underground engineered structures.

【Course Topics】

Theme	Class number of times	Description
Introduction to rock mechanics and rock engineering	1	Introduction to common geophysical investigation methods and field investigation methodology.
Rock mass behaviour around excavations	1	How to apply popular failure criteria to determine the strength of both intact rock and discontinuities. How to assess the geometry of discontinuous rock masses using customary measures and techniques
Rock strength and rock mass classification	2	Rock construction techniques for rock foundation works and also for construction of rock caverns and tunnels. Proposals for support of strength and running of construction works in rocks based on conceptual engineering geological models, assessment of the Q-value and of the mechanical characteristics of the rock mass.
Underground excavations in discontinuous and stratified rock	2	Basic rock geology emphasizing characteristics of rocks, in particular structural features and the importance of discontinuities in rock construction works.
Computer methods in rock mechanics and rock engineering:	2	Introduction to computer programmes for underground space design, rock mechanics, and environmental control.
Hydrogeology and groundwater flow in geotechnical	2	The influence of the groundwater conditions on the characteristics of the rock mass, in particular concerning strength and stability but also rock construction technique and environmental consequences.
Risk assessment and risk management	1	Risk assessment processes in rock engineering and management principles with respect to the environment.

【Textbook】Handout will be distributed.

【Textbook(supplemental)】References are indicated in the handout.

【Prerequisite(s)】Undergraduate courses in geology, geotechnical engineering,and soil mechanics.

【Web Sites】

【Additional Information】

10F407

Environmental Design in Geo-front Engineering

ジオフロント環境デザイン

【Code】10F407 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Wed 2nd 【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】S.Nishiyama,T.Koyama,Y.Ijiri,M.Wada

【Course Description】Practical projects of geo-risk management, advanced measurement method and groundwater environmental-assessment system associaeted with utilization and environmental conservation of underground space are introduced and explained in this lecture.

【Grading】Problem sets will be given almost every week and due one week later in class.
You can work together but turn in your own solutions.

【Course Goals】This course is intended to give students a basic understanding of the theoretical and empirical principles of underground spacce development.
This course will provide the analytical background for students to understand the design principles used in disposal of radioactive Waste project and subsurface CO2 disposal project.

【Course Topics】

Theme	Class number of times	Description
Introduction to underground development	1	Introduction to rock mechanics and rock engineering.
Rock mechanics for underground development	1	Fundamental definitions, historical underground development, underground development art and engineering.
Construction of underground structures	3	Influence of rock strength on excavation, influence of undeground space size, ground support drilling and blasting, mechanism of rock breakage, tunnelling progress with drill and blast excavation.
Hydraulic engineering in underground development	4	Geologic formation as aquifers, , groundwater flow in unsaturated zones and fractured media, hydro-geologic investigation, 3-D general flow equations and advection diffusion equation, groundwater modeling, etc.
Geo-risk engineering	2	Risk identification, risk qualification analysis, risk response, and topics in risk engineering.
Examples of underground development projects	2	Study on underground-space use and construction case studies.

【Textbook】Handout will be distributed.

【Textbook(supplemental)】References are indicated in the handout.

【Prerequisite(s)】Undergraduate courses in geology, geotechnical engineering, and soil mechanics.

【Web Sites】

【Additional Information】

10A055

Environmental Geotechnics

環境地盤工学

【Code】10A055 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 1st

【Location】C1-171 / Bldg.No.3-W3 (Yoshida Campus) 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Takeshi Katsumi and Toru Inui

【Course Description】Strategic and interdisciplinary approaches are vital to solving the global environmental problems. Previous achievements in the research field of Geotechnics have a great potential to contribute helpful solutions to these problems. This course describes the geotechnics to solve the typical geoenviroumental issues including soil & groundwater contamination, geoenvironmental impacts of construction works, and waste management & disposal.

【Grading】Continuous assessment including attendance, some assignments, and final report

【Course Goals】Students should understand the geotechnics to solve the following geoenvironmental issues; soil & groundwater contamination, waste disposal and waste utilization, and extend this knowledge to the development of concepts and technologies for creating and preserving the geo-environment.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Introduction to Environmental Geotechnics, including goals, outline and grading policy of the course
Environmental impacts of construction works	2	Mechanisms and remediation of geoenvironmental problems and geo-disasters caused by construction works
Fundamentals and remediation of soil and groundwater contamination	4	Behaviors of contaminants in subsurface Mechanisms of soil and groundwater contamination Remediation of soil and groundwater contamination Case histories
Geotechnics on waste disposal	4	Functions and structures of waste containment facilities Geotechnics on the liner system (Geosynthetics, clay liner, Leachate collection layer) Post-closure utilization of waste landfill
Geotechnical utilization of waste materials	3	Engineering properties of recycled materials in geotechnical applications (Incineration ashes, coal ash, surplus soils, dredged soils) Geoenvironmental impact assessment and control of waste utilization Case histories

【Textbook】Not specified.

Several technical papers related to the course will be distributed.

【Textbook(supplemental)】Handbook of Geoenvironmental Engineering (Asakura Publishing, ISBN: 9784254261523)

Introduction to Environmental Geotechnics (Japanese Geotechnical Society, ISBN: 9784886444196)

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F109

Disaster Prevention through Geotechnics

地盤防災工学

【Code】10F109 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】C1-117 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Susumu Iai and Mamoru Mimura

【Course Description】The lecture covers geo-hazards, including settlements due to consolidation of clayey ground and seismic hazards to geotechnical structures. In particular, the lecture covers mechanism, failure modes, and mitigation measure to geo-hazards. The lecutre ranges from mechanics of granular materials to numerical simulation.

【Grading】Based on reports to excercises and attendance.

【Course Goals】Successful students will have the ability to initiate their own research work on geo-hazards based on the solid understanding of the mechanics of granular materials and numerical analysis.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Learn Objective, contents, and grading procedure
Fundamentals of continuum mechanics for geotechnics	1	Learn fundamentals of continuum mechanics for geotechnics, including stress, strain, and equilibrium equations
Elasticity and plasticity	1	Learn plasticity, including constitutive equations, failure function, hardening function, Drucker's postulate, and associated law
Behavior of geo-materials and modeling	3	Learn constitutive equations, including (1) Cam-clay model based on energy relation, (2) visco-plastic model, and (3) model with super- and sub-loading surfaces.
Application to boundary value problems	1	Learn application of the constitutive models in geotechnical engineering.
Fundamentals of dynamics	3	Learn fundamentals of dyanamics for numerical analysis of geo-hazards during earthquakes
Mechanics of granular materials	3	Learn granular materials subject to transient and cyclic loads

【Textbook】handouts

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10X313

Governance for Regional and Transportation Planning

地域・交通ガバナンス論

【Code】10X313 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Tue 4th 【Location】C1-171 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】English 【Instructor】KOBAYASHI Kiyoshi
【Course Description】This lecture aims to provide interdisciplinary knowledge associated with appropriate governance strategies for regional, urban, transportation planning. In detail, the contents of lectures consist of following topics: Urban development management based upon PPP, landscape design to support activities, public transportation system for sustainable growth, urban facilities planning considering the variety in behaviors, ITS to support highly-advanced transportation behavior, advanced logistic system, and remote sensing technology for urban and regional planning
【Grading】Participation (10), Presentation (50), Report (40)
【Course Goals】
【Course Topics】

Theme	Class number of times	Description
Introduction of Urban Infrastructure Management	1	
Trust formation and Community Governance	1	
Strategic Complementarity in Transportation Market	1	
Compact city and the governance for cities	2	
Concepts and visions for city logistics	2	
Expectations for ITS and issues	1	
Activity model and transportation management	1	
An evaluation of the proposed symbolic guide signs at intersections	1	
Urban Design Considering Amenity in the River-Front	1	
Remote Sensing for urban planning	2	

【Textbook】
【Textbook(supplemental)】
【Prerequisite(s)】
【Web Sites】
【Additional Information】

10F203

Public Finance

公共財政論

【Code】10F203 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Mon 3rd

【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Kobayashi, Matsushima

【Course Description】The concept of public finance will be taught based upon the framework of Macro economics.

【Grading】Final Exam: 60-70%
Mid-term Exam and Attendance: 30-40%

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Introduction	1	
GNP and Social Accounting	2	
AD-AS Model	3	
IS-LM Model	2	
Monetary Policies	2	
International Economics	2	
Economic Growth Model	2	

【Textbook】

【Textbook(supplemental)】Dornbusch et al., Macroeconomics 10th edition, Mcgrow-hill, 2008

【Prerequisite(s)】Basic Microeconomics

【Web Sites】will be notified in the first class.

【Additional Information】

10F207

Urban Environmental Policy

都市社会環境論

【Code】10F207 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Mon 2nd

【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Dai Nakagawa and Ryoji Matsunaka

【Course Description】This lecture aims to learn urban environmental policy and its fundamental theory and methodology to solve social and environmental problems that occur in urban area as well as to understand the structure of these problems.

【Grading】evaluation by commitment, tests, reports and examination

【Course Goals】to understand the structure of social and environmental problems in urban area and urban environmental policy, its fundamental theory and methodology to solve the problems

【Course Topics】

Theme	Class number of times	Description
Outline	1	
Structure of urban problems	3	Expansion of urban areas, Increase of Environmental impact, Making compact cities
Basic theory of transportation and environment	2	Downtown activation, Road space re-allocation, Pedestrianisation
Road traffic and Public transportation	2	Characteristics of traffic modes, Light Rail Transit, Bus Rapid Transit, Mobility Management
Fundamental theory for measurements of environmental values	3	Utility, Equivalent Surplus, Compensating Surplus
Methodology to measure environmental values	3	Travel Cost Method, Hedonic Approach, Contingent Valuation Method, Conjoint Analysis

【Textbook】No textbook

【Textbook(supplemental)】

【Prerequisite(s)】basic knowledge of public economics is required

【Web Sites】

【Additional Information】

10F213

City Logistics

シティロジスティクス

【Code】10F213 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Wed 3rd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F219

Quantitative Methods for Behavioral Analysis

人間行動学

【Code】10F219 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 5th

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	1	
	1	
	1	
	3	
	1	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F215

Intelligent Transportation Systems

交通情報工学

【Code】10F215 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Fri 2nd 【Location】C1-173
【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese
【Instructor】N. Uno and T. Yamada
【Course Description】This class provides you with the outlines of engineering methodology with information and communication technology as its core element for improving the safety, efficiency and reliability of traffic and transportation systems and reducing the environmental burden. Concretely, we discuss the applicability of countermeasures, such as Travel Demand Management, modal-mix in transportation systems, traffic safety improvement schemes for relieving contemporary problems in traffic and transportation systems, in addition to brief introduction of innovative approaches to collect high-quality of real-time traffic data. Moreover, the methodology for policy evaluation and the related basic theory are explained.
【Grading】Final report: 50-60%, Mid-term report: 30-40% and Attendance: 10%
【Course Goals】Goal of this class is to cultivate basic and critical abilities of students for implementing effective traffic and transportation management using ITS (Intelligent Transportation System).
【Course Topics】

Theme	Class number of times	Description
Basics for Transportation Network Analysis	1	
Estimation of OD Traffic Volume using Observed Link Traffic Counts	1	
Analytical Approaches Based on Transportation Network Equilibrium	3	
Outlines of ITS	1	
Traffic Management for Enhancing Efficiency	2	
Innovative Approaches for Data Collection Using ICT	1	
Application of ITS for Enhancing Traffic safety	1	
Travel Demand Management and Congestion Charging	2	
Application of Traffic Simulation	2	

【Textbook】
【Textbook(supplemental)】
【Prerequisite(s)】
【Web Sites】
【Additional Information】

10A806

Advanced Geoinformatics

空間情報論

【Code】10A806 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 2nd 【Location】C1-117 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture & Exercise 【Language】Japanese 【Instructor】Masayuki Tamura, Junichi Susaki

【Course Description】Geoinformatics is the science and technologies dealing with spatially distributed data acquired with remote sensing, digital photogrammetry, global positioning system, etc, to address the problems in natural phenomena or human activities. This lecture particularly focuses on satellite remote sensing and explains the theory and the technologies for analyzing environmental changes or disaster effects. A free software "MultiSpec" is used in exercises to learn the basic techniques of image processing.

【Grading】Grading is based on the achievements in home works given in every lesson.

【Course Goals】To understand the basic theory and to acquire the basic techniques of satellite remote sensing for observation and analysis of environmental changes and disaster effects.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	1. Introduction to remote sensing 2. Applications in environmental and disaster prevention fields
Classification of electromagnetic waves and satellite sensors	1	1. Classification of electromagnetic waves 2. Basic terms on electromagnetic radiation 3. Theory of electromagnetic radiation from objects 4. Classification of satellite sensors by observation wavelengths
Interaction of electromagnetic waves with earth surfaces	1	1. Reflection and scattering of electromagnetic waves by earth surfaces 1.1 Bidirectional reflectance distribution function 1.2 Bidirectional reflectance factor 2. Spectral reflectance properties of earth surfaces and objects
Atmospheric effects on satellite observations	1	1. Absorption and scattering of electromagnetic waves by atmospheric particles 2. Atmospheric radiative transfer of electromagnetic waves 3. Atmospheric effects on satellite observations 4. Correction of atmospheric effects
Optical sensors	1	1. Principles of visible and reflective infrared sensors 2. Examples of visible and reflective infrared sensors 3. Applications of reflective infrared sensors
Thermal infrared sensors	1	1. Principles of thermal infrared sensors 2. Measurements of surface temperature by satellite sensors 3. Examples of thermal infrared sensors 4. Applications of thermal infrared sensors
Image processing 1 (Image correction)	1	1. Image processing procedure 2. Image enhancement 3. Image correction 4. Correction of geometrical distortion
Image processing 2 (Image classification)	1	1. What is image classification? 2. Theory of image classification 3. Classification rules 4. Image classification procedure
Microwave sensors	2	1. Microwave 2. Microwave sensors 3. Real Aperture Radar (RAR) 4. Synthetic Aperture Radar (SAR) 5. Interferometric SAR 6. Differential Interferometric SAR
Laser data	2	1. Statistical processing of point clouds 2. Three-dimensional modeling using terrestrial laser data 3. Three-dimensional modeling using airborne laser data
Image processing 3	1	1. Edge extraction 2. Segmentation 3. Three-dimensional modeling with laser data

【Textbook】

【Textbook(supplemental)】・ W. G. Rees 著，Physical Principles of Remote Sensing 2nd ed., Cambridge University Press

・ J. A. Richards 著，Remote Sensing Digital Image Analysis: An Introduction, Springer-Verlag

・日本リモートセンシング研究会編，図解リモートセンシング，日本測量協会

・ Fundamentals of Remote Sensing: A Tutorial by the Canada Center for Remote Sensing（http://ccrs.nrcan.gc.ca/resource/tutor/fundam/index$_e$.php）

【Prerequisite(s)】Basic knowledge in computer information processing

【Web Sites】

【Additional Information】

10A808

Civic and Landscape Design

景観デザイン論

【Code】10A808 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 3rd

【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	2	
	2	
	2	
	1	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F223

Risk Management Theory

リスクマネジメント論

【Code】10F223 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Wed 3rd

【Location】C1-173 【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	
	6	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10X333

Disaster Risk Management

災害リスク管理論

【Code】10X333 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Wed 4th 【Location】C1-171
【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】English
【Instructor】TATANO Hirokazu, YOKOMATSU Muneta
【Course Description】Natural disasters have low frequencies but high impacts. It is very important to make an integrated risk management plan that consists of various countermeasures such as prevention, mitigation, transfer, and preparedness. This class will present economic approaches to natural disaster risk management and designing appropriate countermeasures.
【Grading】Evaluate mainly by the presentations in the class as well as end-of-term report, taking active and constructive participation in the class into account.
【Course Goals】Students are expected to understand fundamental ways of economic analyses of disaster prevention such as economic valuation of disaster losses, decision making principle under risks, derivation of benefits of risk management.
【Course Topics】

Theme	Class number of times	Description
Introduction to disaster risk management	1	Introduction and Explanation of Course Outline, The Global Trends of Natural Disasters
1. Decision making theory under uncertainty	1	Bayes' theorem, Expected utility function
Methods of disaster risk management	1	Risk control and risk finance
Economic valuation of catastrophic risk mitigation	1	Cost-Benefit analysis, conventional valuation method, catastrophic risks and economic valuation of disaster mitigation
Risk perception bias, land-use and risk communication	2	Risk perception bias, land-use model, risk communication
Disaster risk finance	2	Recent issues of risk finance market, reinsurance, CAT bond, roles of government, derivatives
Risk curve and risk assessment	1	Fragility curve and risk assessment
General equilibrium analysis under disaster risk	1	General equilibrium model under disaster risk
Macrodynamics under disaster risk	1	GDP, economic growth
Disaster accounting	1	Accounting systems
Exercise and presentation	2	Students' exercise and presentation

【Textbook】Tatano,H., Takagi,A.(ed.):Economic Analysis of disaster prevention, Keiso pub.,2005 (in Japanese).
【Textbook(supplemental)】Froot ,K.A.(ed)“The Financing of Catastrophic Risk”, the University of Chicago Press
Kunreuther H. and Rose, A.,“The Economics of Natural Hazards”, Vol.1 & 2, The International Library of Critical Writings in Economics 178, Edward Elgar publishers, 2004
Okuyama, Y., and Chang, S.T.,(eds.)“Modeling Spatial and Economic Impacts of Disasters”(Advances in Spatial Science), Springer, 2004.
【Prerequisite(s)】Nothing
【Web Sites】No web site
【Additional Information】

693287

Disaster Information

防災情報特論

【Code】693287 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Wed 3rd 【Location】 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Hirokazu Tatano(DPRI), Katsuya Yamori(DPRI), Michinori Hatayama(DPRI), Shingo Suzuki(DPRI)

【Course Description】This lecture gives an outline of disaster prevention and reduction countermeasures both inside and outside Japan with special reference to disaster information related topics. Concrete examples of disaster information systems are introduced to show that psychological aspect of information users under critical social conditions is carefully taken into account in such current disaster information systems.

【Grading】Submit every class reports and end-of-term report Every class reports:

“Point out 3 discoveries for you and 1 request which you want to know more with reasons in this class.

Submit report via Email by the following rules

1. Address: disaster_info@imdr.dpri.kyoto-u.ac.jp
2. subject:“Disaster Information Report [Date] Student ID, Name”
3. Don’t use attached file.
4. Dead line: Next Tuesday

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
What is disaster prevention?	1	
Information system in emergency	2	
Information system in emergency	1	
Case examples on introduction of disaster information system	1	
Information system for evacuation planning,	1	
Information system for rescue activity	1	
Social psychological study of disaster information	2	
Disaster information and evacuation behavior	2	
Gaming approach to disaster risk communication	3	
Test	1	

【Textbook】Nothing

【Textbook(supplemental)】Only Japanese Books

【Prerequisite(s)】

【Web Sites】

【Additional Information】Office Hours: After Class, Make an appointment immediately after.

Questions via Email: disaster_info@imdr.dpri.kyoto-u.ac.jp

10A845

Theory & Practice of Environmental Design Research

環境デザイン論

【Code】10A845 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 2nd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	9	
	5	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A402

Resources Development Systems

資源開発システム工学

【Code】10A402 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 1st

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	6	
	4	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F053

Applied Mathematics in Civil & Earth Resources Engineering

応用数理解析

【Code】10F053 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 3rd

【Location】C1-117 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K008

Computational Mechanics and Simulation

計算力学及びシミュレーション

【Code】10K008 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 2nd 【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture and Exercises 【Language】English 【Instructor】Shirato, Gotoh, Murata, Liang

【Course Description】The process to obtain numerical solutions for various problems in compuational mechanics. Descretization and some solvinng technique for initial/boundary value problems is to be introdeced by the FEM, FDM, VM and PM with programming exercises. Statistical mechanics, molecular dynamics, Monte Carlo method and Multiple scale model will be shortly introduced in order to understand the basic theory of molecular dynamics simulation. Their application to engineering problems are to be also given by showing some up-to-date examples. As one of the dynamic response analysis of engineering structures, evaluation method of Wind-induced response is to be introduced with practical expmaples. Current technology of the particle method by is to be explained on the violent flow phenomena with free surface. The prticular subjects in PM such as mometum conservation and convection of pressure disturbance by numerical instability, etc. will be inntroduced. This course will be given in English.

【Grading】Achievement is evaluated by submitted reports to each topic.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Solving boundary value problem by FEM	4	
Homogenization technique and FEM	4	Homogenization method with FEM will be lectured in this item. It is used for obtaining the equivalent homogenized material constants of an anisotropic composit material to be analyzed. The method to obtain homogenized elastic coefficient tensor will be especially focused on.
Molecular dynamics simulation		
Random vibration analysis of enngineering structures in turbulent flow	2	Theories onn frequency and spectrum analysis, linear system, potential flow, unsteady airfoil, random vibration and extreme value will be digested which are the basis of the above-mentioned response analysis.
Free surface flow analysis by particle method	4	Current technology of the particle method by is to be explained on the violent flow phenomena with free surface. The prticular subjects in PM such as mometum conservation and convection of pressure disturbance by numerical instability, etc. will be inntroduced.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A405

Environmental Geosphere Engineering

地殻環境工学

【Code】10A405 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】C1-192 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F069

Modelling of Geology

数理地質学

【Code】10F069 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】C1-173 【Credits】2

【Restriction】should have unit(s) of an introductory lecture on earth science (i.e. Introduction to Earth Science) and/or earth resources engineering

【Lecture Form(s)】Leture, excercises, field excursions 【Language】Japanese or English (change every year)

【Instructor】Yasuhiro YAMADA

【Course Description】This lecture is on modelling of a geology phenomenon which becomes indispensable when carrying out underground-resources development. First of all, the lecture tells that geologic phenomena are complicated as a fundamental posture and mathematical analysis is possible only a part of them. Then, a various analysis techniques and the analysis example are explained with the basic theory for simplifying the natural phenomena to construct geologic models. Then, field excursions are carried out to see relation between topography and local geology. During the excursions, students learn the conditions and assumptions which are needed to model complicated phenomena in which two or more factors involve. The phenomenon in which modelling is possible is limited to a few part.

【Grading】Based on the reports on the lectures and field excursions.

【Course Goals】Students understand the scope of this lecture, the complexity of natural phenomena and our limited knowledge on them, and can explain the contents to others.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Theme, lecture / excursion schedule, evaluation etc
modelling theory	2	basic theory on geologic modelling
methods and examples	6	methods of geologic modelling and examples are explained with exercises.
excursion 1	4	excursion to NE Kyoto basin to see the relation between topography and geology, in term of an active fault
excursion 2	2	excursion to SW Kyoto basin to see the relation between topography and geology, in term of a relatively inactive fault

【Textbook】no textbook. appropriate articles will be provided.

【Textbook(supplemental)】appropriate books will be informed, this may include ones on geologic modelling.

【Prerequisite(s)】basic knowledge on earth science, including skills to read geologic and geography maps, required.

【Web Sites】

【Additional Information】this lecture includes field excursions. the dates will be determined during the first class, thus all applicants have to attend this class.

10F071

Applied Elasticity for Rock Mechanics

応用弾性学

【Code】10F071 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Fri 3rd

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	1	
	8	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F073

Fundamental Theories in Geophysical Exploration

物理探査の基礎数理

【Code】10F073 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Fri 3rd 【Location】C1-117

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Hitosih Mikada, Tada-nori Goto

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	3	
	3	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F087

Design of Underground Structures

地下空間設計

【Code】10F087 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Tue 3rd

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Toshihiro Asakura, Tsuyoshi Ishida

【Course Description】Outline of the characteristic of underground, the present state and trend of underground development, historical change of underground utilization are explained.
Especially, design and maintenance technology for tunnels and underground opening, and rock stress problem, are lectured in detail.

【Grading】Attendance(50%), class quiz and report(50%)

【Course Goals】Acquire the fundamental technology of underground structure design and maintenance.

【Course Topics】

Theme	Class number of times	Description
Guidance	1	Course description, Grading and Goals
Historical change	1	Historical change of underground development
Environment and Characteristic	1	Environment and Characteristic of underground
Act of deep underground use	1	Social background of the act and engineering problem
Rock stress	2	Underground stability and rock stress problems
Construction(1)	1	Survey technology for tunnelling
Construction(2)	2	Design technology for tunnelling and feed back system
Construction(3)	2	Construction work for tunnelling
Construction(4)	1	Evaluation and utilization of measurement
Maintenance	2	Maintenance technology, Tunnel deformation, Earthquake disaster of tunnels

【Textbook】No set text

【Textbook(supplemental)】Instructed in class

【Prerequisite(s)】Taking Underground Development Engineering and Rock Engineering (when undergraduate) are desirable.

【Web Sites】

【Additional Information】

10F083

Frontiers in Energy Resources

エネルギー資源開発工学

【Code】10F083 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Thu 2nd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F085

Measurement in the earth's crust environment

地殻環境計測

【Code】10F085 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Wed 3rd 【Location】C1-192
【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English
【Instructor】Tsuyoshi ISHIDA, Toshihiro ASAKURA, Koji YAMAMOTO
【Course Description】Necessity of information on the environment in the upper layer of the earth's crust will be explained, as well as measuring methods for it and applications of the measuring results for various engineering projects. Among them, rock stress measurements and their applications will be focused in the relation to the projects of oil field development, underground disposal of high level radio active waste, geological sequestration of CO2, construction of underground power houses and hot dry rock geothermal power extraction. The importance of initial stress conditions on planning and maintenance of tunnels and others also will be discussed.
【Grading】Grading will be made from scores of the followings: ・Report for classes by Ishida. ・Achievement test for classes by Yamamoto. ・Report for classes by Asakura. ・Number of attendance for the classes.
【Course Goals】Goals of this course are the followings. 1) To understand the important effect of initial rock stress on stability of underground chambers and deep underground tunnels. 2) To understand stress relief methods as one of typical methods to measure initial rock stress condition. 3) To understand the principle of a least square method though learning a procedure to determine an initial rock stress condition from released strains measured on a borehole wall. 4) To understand importance and purpose of rock stress measurement for oil field development through borehole breakout problems and others. 5) To understand hydraulic fracturing stress measurement conducted in drill holes for oil field development. 6)To understand history of tunneling technology in Japan. 7) To understand relations between maintenance of tunnels and underground environment. 8) To understand countermeasures against damages of tunnels induced by earthquakes.
【Course Topics】

Theme	Class number of times	Description
Importance of rock stress condition in underground development (by ISHIDA)	3	Necessity of rock stress measurements and their applications for various engineering projects. Among the projects, underground disposal of high level radio active waste, geological sequestration of CO2, construction of underground power houses and hot dry rock geothermal power extraction will be focused.
Stress relief methods to measure rock stress and applicaiton of least square method (by ISHIDA)	3	Actual field works of stress relief methods to measure initial rock stress condition will be explained. Though learning a procedure to determine an initial rock stress condition from released strains measured on a borehole wall, the principle of a least square method will be explained. The report subject will be shown in the last week.
Rock stress measurement for oil field development (by YAMAMOTO)	4	Estimation of rock stress condition by hydraulic fracturing and logging, which is conducted at various steps for oil field development, will be explained. Importance of rock stress affecting on borehole stability will be explained as well.
Tunneling technology in relation to underground environment (by ASAKURA)	4	Tunneling technology in Japan is historically reviewed. Relations between maintenance of tunnels and underground environment and countermeasures against damages of tunnels induced by earthquakes will be explained.

【Textbook】None. Printed materials will be given in classes when needed.
【Textbook(supplemental)】Amadei, B. & Stephansson, O.: Rock Stress and Its Measurements, Capman & Hall, 1977.
【Prerequisite(s)】Elasticity, Linear Algebra (Calculation of Matrices) and Computer Literacy (for example, Excel, Word and so on.)
【Web Sites】
【Additional Information】This class is made by English.

10F039

Time Series Analysis

時系列解析

【Code】10F039 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Tue 4th

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	3	
	1	
	2	
	2	
	1	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F086

Energy System Management

エネルギー基盤マネジメント工学

【Code】10F086 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Fri 2nd 【Location】C1-171 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English 【Instructor】Katsuaki Koike

【Course Description】Securance and develpment harmonious with natural environments of the mineral and fossil energey resources, and utilization of storage function of geologic strata have become important issues for consructing ssustainable society. This subject introduces comprehensively the present situation of uses of mineral and energy resources, crust structure and dynamics, economic geology for the genesis and geologic envisonments of deposits, physical and chemical exploration methods of marine deposits, mathematical geology for reserve assessment, engineering geology for resource development and geological repository, and problems and promisingness of natural energy such as geothermal, solar, wind, and tide.

【Grading】Integrated evaluation by attendance to the classes and report grades

【Course Goals】To find out directionality about the technologies required for constructing sustainable society by yourself with full understandings of genetic mecanism, biased distribution, and the present situation of demand and supply of the mineral and energy resources.

【Course Topics】

Theme	Class number of times	Description
Introduction of mineral resources	1	Classification of minerals used for resources, recent trend on social demand of mineral resources, industrial uses of each mineral, and sustainability.
Introduction of Energy resources	1	Classification of energy sources, recent trend on social demand of energy, physical characteristics of each energy resources, and sustainability.
Physical and chemical properties of crust	1	Inner structure of the Earth, geodynamics, geologic composition, temperature structure, rock physics, and chemical composition of crust.
Economic geology (1)	1	Classification of ore deposits, distribution of each type of ore deposit, generation mechanism of deposit.
Economic geology (2)	1	General structure and distribution of fuel deposits (coal, petroleum, and natural gas), generation mechanism of deposits, and geological process of formation.
Resource exploration (1)	1	Physical and chemical exploration technologies for natural resources in terrestrial area. Representative methods are remote sensing, electric sounding, electromagnetic survey, and seismic prospecting.
Resource exploration (2)	1	Introduction of marine natural resources such as methane hydrate, cobalt-rich crust, and manganese nodule, and exploration technologies for the deposits in sea area.
Assessment of ore reserves and reservoir characterization	1	Fundamentals of geostatistics, variography for spatial correlation structure, spatial modeling by kriging, geostatistical simulation, integration of hard and soft data, and feasibility study
Resource development (1)	1	Development and management technologies of energy resources related to coal, petroleum, and natural gas.
Resource development (2)	1	Characteristics of natural energy related to geothermal, solar, wind, and tide, assessment of natural energy resources, and development and management technologies of resources.
Resource development (3)	1	Development of uranium deposits, mechanism and characteristics of nuclear power generation, and management technologies of nuclear power.
Engineering geology (1)	1	Groundwater, long-term stability assessment of rock mass, chemical reaction of rocks with groundwater, and hydraulic properties of rocks at multi-scales.
Engineering geology (2)	1	Fundamentals of deep geological repository for high-level nuclear waste, CCS (carbon dioxide capture and storage), and underground storage of petroleum and gas.
Sustainability	1	Co-existence of natural resource development with environment, low-carbon society, and problems for human sustainability.

【Textbook】Printed materials on the class contents are distributed before each class.

【Textbook(supplemental)】References on each topic will be instructed in classes.

【Prerequisite(s)】Elementary knowledge of engineering, mathematics, physics, and geology.

【Web Sites】

【Additional Information】

10F081

Infrastructure Creation Engineering

社会基盤工学創生

【Code】10F081 【Course Year】 【Term】1st term 【Class day & Period】Thu 4th 【Location】C1-192

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	2	
	2	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10X311

Urban Infrastructure Management

都市基盤マネジメント論

【Code】10X311 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Mon 3rd

【Location】C1-117 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】English

【Instructor】OHTSU Hiroyasu

【Course Description】This lecture aims to provide interdisciplinary knowledge associated with how urban infrastructure is comprehensively management, from viewpoint of not only economy but also "human security engineering". In detail, the contents of lectures consist of following topics:
Urban Infrastructure Asset Management,
Urban Environment Accounting System,
Urban Energy Supply Management,
Urban Food/Water Supply Management,
Urban Transport/Logistics Management.

【Grading】Participation(10), Presentation(50), Report(40)

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Guidance, Introduction of Urban Infrastructure Asset Management	2	
Urban Infrastructure Asset Management	3	
Urban Transport/Logistics Management	3	
Urban Environment Accounting System	2	
Urban Food/Water Supply Management	2	
Urban Energy Supply Management	2	
Presentation	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F112

Introduction to Sustainability/ Survivability Science

生存科学概論

【Code】10F112 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 1st 【Location】C1-192 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English 【Instructor】K. Takara (DPRI), H. Ishikawa (DPRI), B. He (DPRI), T. Hosoda (Engineering) and S. Yoden (Science)

【Course Description】There are many threats for human beings on the earth: medicine/infectious diseases, food, population, energy, water, environment and natural hazards and disasters. This class gives how to cope with these for human beings and societies. If we realized sustainable society, there are still catastrophes that we have to face. This class considers how to survive such catastrophic situations. Especially focused on are frequent and amplified extreme weather due to climatic change (or global warming) and subsequent severe disasters, water and environmental problems. Concepts and technologies for these problems are introduced, discussing the future perspectives of our society, science and technology based on various aspects and examples of climate, culture and ways of life in the world.

【Grading】Students will be evaluated by the number of attendance and a final written examination.

【Course Goals】Any graduate students in various disciplines can join this class. Mixture of different graduate students from different disciplines gives good discussions in the classroom in which global issues will be introduced and discussed by the teachers and students together. This is a graduate school level lecture class including presentations by students.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	The framework of sustainability/survivability science is given to understand its significance.
Examples	2	Introducing how to cope with various examples of threats that human beings are facing: medicine/infectious diseases, food, population, energy, water, environment and natural hazards and disasters.
Global warming and mitigation	3	A theory of global warming, technical countermeasures of mitigation and political situation in the world are given.
Extreme weather and its prediction	2	Recent water-related disasters and water problems due to extreme weather are introduced.
Adaptation	3	Examples and ideas of adaptation in the world are considered to cope with water-related disasters that are occurring more frequent and getting bigger.
Discussions	3	Giving students an opportunity to express their own ideas, teachers and students discuss his/her ideas.
Summary	1	Conclude this series of lectures.

【Textbook】No textbook specified. Handouts will be distributed if necessary.

【Textbook(supplemental)】Relevant literature would be introduced.

【Prerequisite(s)】The class is given in English with some Japanese language supplement for technical/special words. No background knowledge is necessary. Reading, writing and discussing in English is requirement.

【Web Sites】This lecture is related to a Global COE Program “Sustainability/survivability science for a resilient society adaptable to extreme weather conditions” (GCOE-ARS) for a period of 2009 to 2013. See also http://ars.gcoe.kyoto-u.ac.jp/ for further information.

【Additional Information】This class, which is given as graduate school-level lectures, can be taken by any graduate students from different disciplines including natural science, social science and humanity. Mixture of graduate students from different disciplines encourages exciting and interesting discussions by them to discuss global environmental issues with several professors and PDs.

693291

Emergency Management Systems

危機管理特論

【Code】693291 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 4th

【Location】Bldg.No.10-Informatics 1 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	4	
	3	
	3	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F201

Information Technology for Urban Society

都市社会情報論

【Code】10F201 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Thu 1st

【Location】C1-192 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Related Instructors

【Course Description】The advancement of urban society by the use of information has been realized through the remarkable development of informational communication technology. This seminar has the discussions about the worth and affect in the urban society using engineering and economic estimation method, and lectures about the way of maintenance, operation and management of urban systems in the advanced informational and knowledge-intensive society.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Details will be provided in the first lecture.

10U059

Internship on Infrastracture Engineering

社会基盤工学インターンシップ

【Code】10U059 【Course Year】Master and Doctor Course 【Term】 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】Through the long-term internship outside the university, the students can get the practical techniques, the way of finding and solving the problems, the way of integrating the techniques, the way of summarizing the results and making the presentation in each field of Urban Management.

【Grading】Writing plans, completing internship, final report and presentation are comprehensively evaluated.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10U051

Integrated Seminar on Infrastracture Engineering A

社会基盤工学総合セミナーA

【Code】10U051 【Course Year】Doctor 1st 【Term】1st term 【Class day & Period】Fri 5th 【Location】C1-171

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10U052

Integrated Seminar on Infrastracture Engineering B

社会基盤工学総合セミナー B

【Code】10U052 【Course Year】Doctor 1st 【Term】2nd term 【Class day & Period】Tue 5th

【Location】C1-171 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】English

【Instructor】Related instructors

【Course Description】On the investigation of themes by the students, they make the presentation and discussion in English. The themes are about the technology innovation of infrastructure on the international viewpoint, the ideal style of infrastructure management, the standardization of project technology for internationalization, and about the technology movement or the role of Japan in the world on the construction of infrastructure and the usage of resource energy such as the development and utilization of international crust or resource energy.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Details will be provided in the guidance and first lecture.

10U060

ORT on Infrastructure Engineering

社会基盤工学ＯＲＴ

【Code】10U060 【Course Year】Doctor 1st 【Term】1st+2nd term

【Class day & Period】1st term: Thu 3rd&4th, 2nd term: Thu 4&5th 【Location】C1-173 【Credits】4 【Restriction】

【Lecture Form(s)】 【Language】 【Instructor】Related instructors

【Course Description】By practicing about the research themes on Infrastructure Engineering and making the presentations of the research results at the conferences, the students can develop the advanced specialities and the ability of finding out the new fields of research. Also, the students get the practical ability which is necessary for researchers and engineers. The students can participate in the conferences at home and abroad, in the presentations of research at laboratory, in some kinds of seminars, symposiums, lecture classes, internship to the enterprises or research organizations at home and abroad. The director of the department and the supervisor totally evaluate the reports made about these activities by the students.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Details will be provided in the guidance.

10U063

Practice in Advanced Infrastructure Engineering

社会基盤工学総合実習

【Code】10U063 【Course Year】Doctor 1st 【Term】1st+2nd term

【Class day & Period】1st term: Mon 4th, 2nd term: Fri 5th 【Location】1st term: C1-171, 2nd term: C1-172

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】In this seminar, the research themes are given to the students, including the advancement of state-of-the-art scientific technology, the resolution of natural disaster mechanism, the advancement of technology for reduced disaster, the advancement of integrated architecture or management technology in infrastructure, the utilization of natural resource and energy in the developmental and sustainable society, the contribution to resolve some problems for the realization of low carbon society. The students have to make the reports and presentations about these themes through the discussion with the supervisors.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z001

Urban Transport Policy

都市交通政策フロントランナー講座

【Code】10Z001 【Course Year】Master and Doctor Course 【Term】1st term

【Class day & Period】see the handbook for course registration

【Location】conference room, UPL karasuma office （see the handbook for course registration） 【Credits】1

【Restriction】see the handbook for course registration 【Lecture Form(s)】Intensive Lecture 【Language】Japanese

【Instructor】Dai Nakagawa, JongJin Yoon, Tetsuharu Oba, and Mitsuya Matsubara

【Course Description】This class will provide lectures on the new transport policy carried out in domestic and foreign cities and to understand the difference between the conventional transport policy and the new urban transport policy. Also, it will cover a process to realize the new urban transport policy.

【Grading】evaluation by attendance and class participation

【Course Goals】to understand the difference between the conventional transport policy and the new urban transport policy

【Course Topics】

Theme	Class number of times	Description
Outline	1	
Front runner of urban transport policy in the world	2	Reallocation of road space, Pedestrianisation
Front runner of urban transport policy in Japan	1	Downtown activation, Strategies of sustainable transport for our cities, Climate change
Front runner of urban transport policy in Kyoto	1	Eco model city, Transport demand management, Public transport network
Basic concept and best practices of new urban transport policy	1	Community bus, Compact city
Discussion and presentation	2	

【Textbook】No textbook

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.upl.kyoto-u.ac.jp/index.html

【Additional Information】

10Z002

Policy for Low-Carbon Society

低炭素都市圏政策論

【Code】10Z002 【Course Year】Master and Doctor Course 【Term】1st term

【Class day & Period】see the handbook for course registration

【Location】conference room, UPL karasuma office （see the handbook for course registration） 【Credits】1

【Restriction】see the handbook for course registration 【Lecture Form(s)】Intensive Lecture 【Language】Japanese

【Instructor】Dai Nakagawa, Eiichi Taniguchi, Masashi Kawasaki, Yasunaga Wakabayashi, Tsutomu Doi, JongJin Yoon, Mitsuya Matsubara

【Course Description】This class will provide lectures on the contents of policies and the methods to realize a low carbon society. Also, it will cover the knowledge and the technical skill to relate to urban activation, reduction of the environmental load, compact city planning, and so on.

【Grading】evaluation by attendance and class participation

【Course Goals】to understand the knowledge and the technical skill to relate to urban activation, reduction of the environmental load, compact city planning, and so on.

【Course Topics】

Theme	Class number of times	Description
Outline	1	
Direction of urban policy for low-carbon society	1	Compact city, Interaction between land-use and transport
Urban policy for low-carbon society and change of urban structure	1	Public transport, Pedestrianisation
Landscape & environmental planning	1	Landscape design in public space, View structure
Downtown activation & urban policy for low-carbon society	1	Downtown activation, Compact city
Urban policy management for low-carbon society	1	Eco model city、Guideline for low-carbon city construction
City logistics	1	Logistics、Corporate social responsibility, Intelligent transport systems、Freight quality partnership
Discussion	1	

【Textbook】No textbook

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.upl.kyoto-u.ac.jp/index.html

【Additional Information】

10Z003

Urban Transport Management

都市交通政策マネジメント

【Code】10Z003 【Course Year】Master and Doctor Course 【Term】1st term

【Class day & Period】see the handbook for course registration

【Location】conference room, UPL karasuma office （see the handbook for course registration） 【Credits】1

【Restriction】see the handbook for course registration 【Lecture Form(s)】Intensive Lecture 【Language】Japanese

【Instructor】Dai Nakagawa, Satoshi Fujii, Nobuhiro Uno, JongJin Yoon, Tetsuharu Oba, and Mitsuya Matsubara

【Course Description】This class will provide lectures on characteristics and problems of transport modes such as car, public transport, and foot. Also, it will cover the technical skill to analyze present urban traffic problems quantitatively.

【Grading】evaluation by attendance and class participation

【Course Goals】to understand characteristics and problems of transport modes such as car, public transport, and foot.

【Course Topics】

Theme	Class number of times	Description
Outline	1	
Plan and practice of public transport	1	City activation and attractiveness, Public transport, Light rail transit, Bus
Basic concept of mobility management	1	Mobility management, Activation of the public transport, Downtown activation
Investigation, interpretation, and evaluation on urban traffic phenomenon	3	Person trip survey, Transportation demand management, Cost-benefit analysis
Exercise and discussion	2	

【Textbook】No textbook

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.upl.kyoto-u.ac.jp/index.html

【Additional Information】

10Z050

Liveable City Design

安寧の都市デザイン

【Code】10Z050 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Wed 1st

【Location】【Credits】2 【Restriction】see the handbook for course registration 【Lecture Form(s)】Relay Lecture

【Language】Japanese 【Instructor】Eiichi Taniguchi

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z051

Contemporary advanced urban policy I

現代都市政策特論Ⅰ

【Code】10Z051 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration 【Location】 【Credits】2

【Restriction】see the handbook for course registration 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Eiichi Taniguchi

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	2	
	2	
	2	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z052

現代都市政策特論II

【Code】10Z052 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	6	
	3	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z053

Contemporary Health Sciences I

現代健康科学特論Ⅰ

【Code】10Z053 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration 【Location】 【Credits】2

【Restriction】see the handbook for course registration 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z054

現代健康科学特論Ⅱ

【Code】10Z054 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z055

アメニティ都市政策論

【Code】10Z055 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 5th 【Location】 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z056

都市健康科学基礎論

【Code】10Z056 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z057

Foundation of Disaster Medicine

災害医療基礎論

【Code】10Z057 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration 【Location】 【Credits】2

【Restriction】see the handbook for course registration 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z058

Seminar on Liveable Cities A

安寧の都市セミナーA

【Code】10Z058 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration 【Location】 【Credits】1

【Restriction】see the handbook for course registration 【Lecture Form(s)】Relay Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z059

安寧の都市セミナー B

【Code】10Z059 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】1 【Restriction】

【Lecture Form(s)】Relay Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z060

クライシスマネジメント

【Code】10Z060 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z061

KANSEI urban engineering

感性都市工学

【Code】10Z061 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration 【Location】 【Credits】2

【Restriction】see the handbook for course registration 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z062

実践プロジェクト

【Code】10Z062 【Course Year】 【Term】1st+2nd term 【Class day & Period】 【Location】 【Credits】2

【Restriction】 【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	6	
	1	
	6	
	1	
	6	
	1	
	7	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F464

Hydrologic Design and Management

水工計画学

【Code】10F464 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 3rd 【Location】C1-173

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Michiharu SHIIBA, Yasuto TACHIKAWA and Sunmin KIM

【Course Description】Methods for hydrologic design and real-time rainfall-runoff predictions are described. The frequency analysis of hydrologic extreme values and the time series analysis of hydrologic variables are described, and then the methods to set the external force for the hydrologic design are explained. Next, a physically based hydrologic model which includes the process of human activities for the hydrologic cycle is described. In addition, the predictive uncertainty for the hydrologic simulation is introduced. A flood control planning and water resources management with the use of innovative hydrologic simulation tools is described. Then, the climate change and the relation to the hydrologic design are discussed. A real-time rainfall runoff prediction method with the use of Kalman filter theory is described.

【Grading】Examination and report

【Course Goals】The class aims to understand the statistical analysis and time serried analysis of hydrologic variables to set the external force of hydrologic designs, applications of hydrologic simulations for hydrologic designs, and real-time rainfall and runoff prediction methods for water resources management.

【Course Topics】

Theme	Class number of times	Description
Introduction	0.5	The aim of the class is introduced. The flood control planning and water resources planning are introduced.
Frequency analysis and hydrologic design	1.5	The frequency analysis of hydrologic extreme values is described. The methods to set the external force for the hydrologic design are explained.
Time series analysis and hydrologic design	3	The time series analysis of hydrologic variables is described. The methods to develop time series models, time serried data generation methods, spatiotemporal variation of hydrologic variables and a random field model, disaggregation methods are explained.
Hydrologic modeling and modeling system	1	A physically based hydrologic model which includes the process of human activities for the hydrologic cycle is described. A hydrologic modeling system which helps to develop complicated hydrologic simulation models is also described.
Hydrologic predictive uncertainty	1	Hydrologic predictive uncertainty is explained, which is inevitable and comes from model structure uncertainty, parameter identification uncertainty and model input uncertainty. Especially, the relation between spatiotemporal scales of hydrologic modeling and model parameter values is described, and then the linkage between the relation and the hydrologic predictive uncertainties is discussed.
Flood prediction and hydrologic design	1	A physically-based distributed hydrologic model which incorporates dam reservoir operation is introduced. Evaluation of the effect of flood control facilities and more effective dam reservoir operation are discussed.
Climate change and hydrologic design	2	Data analysis of the latest GCM simulation is presented and the possible changes of hydrologic extremes and hydrologic design are discussed.
Real-time rainfall runoff prediction	4	A real-time rainfall runoff prediction method with the use of Kalman filter theory is described.

【Textbook】Non. Handouts are distributed at each class.

【Textbook(supplemental)】

【Prerequisite(s)】Basic knowledge of hydrology, probability and statistics

【Web Sites】http://hywr.kuciv.kyoto-u.ac.jp/lecture/lecture.html

【Additional Information】

10F245

Open Channel Hydraulics

開水路の水理学

【Code】10F245 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 1st 【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English 【Instructor】HOSODA, Takashi

【Course Description】Fundamental theory of Open Channel Hydraulics used in River Engineering and Urban Fluid Engineering Fields are lectured, showing various applications in Hydraulic Engineering Field. The contents include the following items: Application of singular point theory to water surface profile analysis, Derivation of 2 -D depth averaged model, 1-D analysis of unsteady open channel flows, Plane 2-D analysis of steady high velocity flows, Plance 2-D analysis of unsteady flows, Higher order theory, etc.

【Grading】Regular examination

【Course Goals】to understand the grounds of Open Channel Hydraulics and to learn how to apply Open Channel Hydraulics to practical problems in hydraulic engineering field.

【Course Topics】

Theme	Class number of times	Description
Guidance	1	The outline of this class is introduced by overviewing the whole framework of Open Channel Hydraulics with various computational results.
Derivation of 2-D depth averaged model	1	Derivation procesures of plane 2-D depth averaged model are expalined in detail
Application of singular point theory to water surface profile analysis	1	
1-D analysis of unsteady open channel flows	3	Fundamental characteristics of 1-D unsteady open channel flows, Method of Characteristics, Dam break flow, Computational methods
Plane 2-D analysis of steady high velocity flows	1	Characteristics of steady plane 2-D flow are explained based on the method of characteristics.
Plance 2-D analysis of unsteady flows	3	Propagation of characteristic furface, shear layer instability, application of a generalized curvilinear coordinate to river flow computation, application of a moving coordinate system, etc.
Higher order theory	3	Boussinesq equation with the effect of vertical acceleration, full/partially full pressurized flow onserved in sewer network, trafic flow analysis by means of dynamic wave model

【Textbook】Printed materials on the contents of this class are distributed in class.

【Textbook(supplemental)】

【Prerequisite(s)】Elementary knowledge of fluid dyanamics and hydraulics

【Web Sites】

【Additional Information】Students can contact with Hosoda by sending e-mail to hosoda.takashi.4 w@kyoto-u.ac.jp This class is not open in 2011.

10F269

Coastal and Urban Water Disasters Engineering

沿岸・都市防災工学

【Code】10F269 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】C1-192 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	3	
	1	
	1	
	1	
	1	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F466

Basin Environmental Disaster Mitigation

流域環境防災学

【Code】10F466 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 3rd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	3	
	3	
	3	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F023

Numerical Methods in Geomechanics

地盤数値解析法

【Code】10F023 【Course Year】 【Term】1st term 【Class day & Period】Thu 1st 【Location】C1-117

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	3	
	6	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F222

Advanced Transport Logistics

先進交通ロジスティクス工学

【Code】10F222 【Course Year】 【Term】 【Class day & Period】 【Location】 【Credits】 【Restriction】

【Lecture Form(s)】Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A420

Lecture on Exploration Geophysics

探査工学特論

【Code】10A420 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Wed 4th

【Location】C1-117 【Credits】2

【Restriction】The class of "Fundamental theories of geophysical exploration" is recommended to acuire.

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Hitosih Mikada, Tada-nori Goto

【Course Description】Applied geophysical exploration technologies in disaster mitigation, civil engineering, and earth resources engineering is discussed in terms of seismological and of electromagnetic theories. Students may be asked to process data or design digital filters in the course.

【Grading】Attendances to the class and reports are weighted as 60 and 40, respectively.

【Course Goals】Understanding seismiclogical and electromagnetic theories used in geophysical exploration and subsurface-imaging technologies.

【Course Topics】

Theme	Class number of times	Description
Electromagnetic signal processing	3	Principles of magnetotelluric methods, electromagnetic sources and noise reduction.
Modeling technologies in electromagnetic methods	3	Subsurface structure modeling in EM methods. The effects of surface weathered layers, the identification of spatial dimensions, and modeling methodologies are discussed.
Signal processing in seismics	3~4	Digital filtering in seismic data processing.
Reflection seismology	3	Fundamental theories of reflection seismic data processing. Seismic migration is the one to be briefly discussed.
Petrophysics	1~2	Fundamental petrophysics, and fundamental measurement theories in geophysical logging are discussed.

【Textbook】Specified in the course.

【Textbook(supplemental)】J.F.Claerbout, 1976, Fundamentals of Geophysical Data Processing, (OOP:photocopies to be specified)

【Prerequisite(s)】The credits of "Exploration Geophysics" in undergraduate course and "Fundamental Theories of Geophysical Exploration" in graduate course are requested to obtain before the classes.

【Web Sites】May be specified by the lecturers.

【Additional Information】

10Z004

Policy for Low-Carbon Society, Advanced.

低炭素都市圏政策特論

【Code】10Z004 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration

【Location】2nd floor conference room, UPL karasuma office 【Credits】1

【Restriction】see the handbook for course registration 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Kiyoshi Kobayashi

【Course Description】This class will provide lectures on integrated policy packages of pricing, energy policy, urban land use as well as the contents of transport policy to realize a low carbon society. Also, it will cover current trends of various policies and technologies for a low carbon society.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】No textbook

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.upl.kyoto-u.ac.jp/index.html

【Additional Information】

10Z005

Urban Transport Management, Advanced.

都市交通政策マネジメント特論

【Code】10Z005 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration

【Location】2nd floor conference room, UPL karasuma office 【Credits】1

【Restriction】see the handbook for course registration 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Dai Nakagawa, Ryoji Matsunaka, Satoshi Fujii, JongJin Yoon, Tetsuharu Oba, and Mitsuya Matsubara

【Course Description】This class will provide lectures on advanced technical skill to analyze present urban traffic problems quantitatively and evaluation methods of the policy. Also, it will cover the contents of transportation funding and consensus building, and so on.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】No textbook

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.upl.kyoto-u.ac.jp/index.html

【Additional Information】

10Z006

Capstone Project Practice

キャップストーンプロジェクト演習

【Code】10Z006 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration

【Location】2nd floor conference room, UPL karasuma office 【Credits】1

【Restriction】see the handbook for course registration 【Lecture Form(s)】Seminar 【Language】Japanese

【Instructor】Dai Nakagawa, Ryoji Matsunaka, JongJin Yoon, Tetsuharu Oba, and Mitsuya Matsubara

【Course Description】A capstone is a finishing stone placed on the apex of a pyramid. This class will enable students to apply and integrate what they learn, and give them an opportunity to explore in greater depth, one or more of the topics covered in the courses.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	1	
	3	
	1	

【Textbook】No textbook

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.upl.kyoto-u.ac.jp/index.html

【Additional Information】

10F251

Exercise on Project Planning

自主企画プロジェクト

【Code】10F251 【Course Year】Master 1st 【Term】1st+2nd term

【Class day & Period】1st term: Thu 3rd, 2nd term: Wed 5th 【Location】C1-192 【Credits】2

【Restriction】No Restriction 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】Related instructors

【Course Description】The purpose of this seminar is to bring out the self-initiative, the planning ability, the creativity of students. From project and to practice, the students set up the goals of projects, go ahead with the projects by themselves, and finally make the presentations of project results. Specifically, about the internship activities in enterprises, the training activities in enterprises or universities at home and abroad, the planning and operation of collaborative projects with citizen, the student makes the perfect plannings including the purposes, the ways, the results and so on. For a final, the students do practice, they write the reports and make the presentations about the project results.

【Grading】Planning, implementation of project and reports are comprehensively evaluated.

【Course Goals】Goals are cultivating ability for self-initiative, planning and creativity.

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Details are provided in the first lecture.

10F253

Capstone Project

キャップストーンプロジェクト

【Code】10F253 【Course Year】Master 1st 【Term】1st+2nd term

【Class day & Period】1st term: Thu 2nd, 2nd term: Thu 4th 【Location】1st term: C1-173, 2nd termC1-171

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Exercise 【Language】Japanese

【Instructor】Related instructors

【Course Description】The students make the projects and plannings on various problems in the urban society by widely making use of the basic knowledge which you've gotten in Department or Master Course. Actually, the students simulate the actual problems, and make the collection and analysis of datas. By that, the students evaluate the practice and effect of projects. At the end , the students write the reports about a series of project results and make the presentations about them.

【Grading】Evaluation for each student is made comprehensively based on both report and presentation about the project, and usual contribution of student to the project.

【Course Goals】Goals are to cultivate student ’s ability for planning, creativity and communication.

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Details will be provided in the first lecture.

10F257

Seminar on Urban Management A

都市社会工学セミナー A

【Code】10F257 【Course Year】Master 1st 【Term】1st+2nd term

【Class day & Period】1st term: Fri 4&5th, 2nd term: Mon&Tue 5th 【Location】 【Credits】4

【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】Related instructors

【Course Description】This seminar has the lectures about the movement and content of the most advanced research at home and abroad on Urban Management Engineering.. Also, the teachers in this seminar instruct the students individually about the planning of study schedule, the way of collecting datas, doing the research and summarizing the results of research on the concrete and specific themes.

【Grading】Points are allocated for research activities such as a presentation at laboratory seminars, domestic conferences, international conferences, research paper presentation etc. Students are required to obtain the points in total which are more than predefined points.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F259

Seminar on Urban Managemen B

都市社会工学セミナー B

【Code】10F259 【Course Year】Master 1st 【Term】1st+2nd term

【Class day & Period】1st term: Wed&Thu 5th, 2nd term: Thu&Fri 5th 【Location】 【Credits】4

【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】Related instructors

【Course Description】The students make the collection of datas, research and summarize the research results about the concrete and specific themes on Urban Management Engineering.. In addition, the teachers in this seminar instruct the students individually about the way of presentations of research results through the presentations and questions at the conferences at home and abroad, the ones at laboratory and participation in lecture classes.

【Grading】Points are allocated for research activities such as a presentation at laboratory seminars, domestic conferences, international conferences, research paper presentation etc. Students are required to obtain the points in total which are more than predefined points.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10U210

Practice in Urban Management

都市社会工学実習

【Code】10U210 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Wed 1st

【Location】C1-173 【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese

【Instructor】Related instructors

【Course Description】The purpose of this seminar is to develop the student's fundamental understanding into the applied understanding about the various types of techniques on Urban Management. By taking the practical programs of shared major classes under the instructions of teachers in charge, and participating in the practical programs offered by some organizations and associations outside the university, the students can improve the ability of resolving some problems on Urban Management. These are limited to the programs certified as the department.

【Grading】Attendance and reports are comprehensively evaluated.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F003

Continuum Mechanics

連続体力学

【Code】10F003 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Mon 2nd 【Location】C1-192
【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese
【Instructor】Kunitomo Sugiura, Tomomi Yagi
【Course Description】Continuum mechanics is a unified basis for solid mechanics and fluid mechanics. The aims of this course are to introduce the continuum mechanics from their basics to the some forms of constitutive law and also to provide students with mathematical way of understanding the continuum mechanics. This course contains the fundamentals of vector and tensor calculus, the basic equations of continuum mechanics, the tensor expressions of elastic problems and further applications.
【Grading】Assessment will be based on exam, report and attendance.
【Course Goals】Fundamental theorems on structural mechanics and design will be learned, and ability to judge the proprieties of each computational structural analysis will be acquired.
【Course Topics】

Theme	Class number of times	Description
Introductions	1	
Matrices and tensors	1	
differential and integral calculus of tensors	1	
Kinematics	1	- Material derivative
Deformation and strain	2	- Strain tensors - Compatibility conditions
Stress and equilibrium equation	1	
Conservation law and governing equation	1	
Constitutive equation of idealized material	1	
Elastic-plastic behavior and constitutive equation of construction materials	1	
Boundary value problem	1	
Variational principle	1	
Various kinds of numerical analyses	2	

【Textbook】
【Textbook(supplemental)】
【Prerequisite(s)】Basic knowledge for structural mechanics, soil mechanics and fluid mechanics are required.
【Web Sites】
【Additional Information】

10F067

Structural Stability

構造安定論

【Code】10F067 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】C1-171 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Shirato, H. and Sugiura, K.

【Course Description】Discussed in the class are stability/instability of large structural systems and improvement of their safety and performance. The aim of this course is to provide details of structural stability under static and dynamic loading, and technical issues to improve the safety of structures. In addition, typical examples in the practice in structural design are also provided.

【Grading】Assessment will be based on exam, reports and attendance.

【Course Goals】The basic knowledge for structural stability under static and dynamic loading, which are necessary for the structural design of bridges, will be acquired.

【Course Topics】

Theme	Class number of times	Description
Elastic Stability under Static Loading	7	Stability of Structures and Failures Basis of Structural Stability Elastic Buckling of Coulmns Elastic Buckling of Beams & Frames Elastic Buckling of Plates Elasto-plastic Buckling Buckling Analysis
Structural Stability under Dynamic Loading	7	Introduction of Wind-induced Vibration Nonlinear Response due to Wind and Its Stability Discriminant: Part 1 Nonlinear Response due to Wind and Its Stability Discriminant: Part 2 Nonlinear Response due to Wind and Its Stability Discriminant: Part 3 Nonlinear Response due to Wind and Its Stability Discriminant: Part 4 Wind-induced Response Analysis of Long Span Bridges: Flutter Analysis Wind-induced Response Analysis of Long Span Bridges:Buffeting Analysis
Achievement Check	1	Summary and Achievement Check

【Textbook】not specified

【Textbook(supplemental)】Introduced in class if necessary

【Prerequisite(s)】Basic knowledge for structural mechanics, continuum mechanics and structural analysis are required.

【Web Sites】

【Additional Information】

10F068

Material and Structural System & Management

材料・構造マネジメント論

【Code】10F068 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd 【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】Toyoaki Miyagawa, Hirotaka Kawano, Atsushi Hattori, Takashi Yamamoto

【Course Description】Microscopic structures of various construction materials are introduced. Theoretical and experimental examination on their effects on various engineering properties are explained. With major view on steel and concrete, their engineering properties are introduced to discuss influences of the properties on mechanical and durability performances of concrete structures subjected to steel corrosion and alkali-aggregate reaction. In addition, management of infrastructures are lectured with the software aspects required in economy, environment, education as well as with maintenance based on hardware techniques.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
1. Properties and performances of concrete, materials and structures	2	
2. Outline of maintenance of structures	2	
3. Maintenance of structures - deterioration predictions, evaluation and judgement	2	
4. Maintenance of structures - remedial actions - repair and strengthening	2	
5. Presentations and discussions	3	
6. Structures Management	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F261

Earthquake Engineering/Lifeline Engineering

地震・ライフライン工学

【Code】10F261 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 4th

【Location】C1-191 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Kiyono, Koike, Igarashi

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	1	
	1	
	1	
Principles of seismic design of structures	2	
Seismic performance of concrete and steel structures	1	
Seismic isolation and structural control	1	
Seismic retrofit and rehabilitation of structures	1	
	1	
	2	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10W001

Infrastructural Structure Engineering

社会基盤構造工学

【Code】10W001 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 2nd 【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】

【Course Description】Structural engineering problems related to planning, design, construction and maintenance of the infrastructures are discussed. Topics concerning structural engineering and management are widelly taken up including latest advanced knowledge and technology, future view and/or international topics. Special lectures by extramural lecturers are carried out if necessary.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	4	
	2	
	5	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F009

Structural Design

構造デザイン

【Code】10F009 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Fri 2nd
【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese
【Instructor】Tomoaki Utsunomiya, Yoshikazu Takahashi, Yoshiaki Kubota
【Course Description】This course provides the knowledge of the structural planning and design for civil infrastructures. Fundamentals of the reliability of structures based on the probability and statistics are given. Emphasis is placed on the reliability index and the calibration of partial safety factors in the LRFD design format. Furthermore, the structural morphology, aesthetics and case studies of structural design that satisfies “utilitas, firmitas and venustas” are given. Then we discuss what the holistic structural design should be.
【Grading】Assessed by term-end examination, reports and quizes
【Course Goals】To understand the structural planning and design for civil infrastructures.
To understand the reliability-based design of structures.
To deepen the understanding of aesthetics of structures.
【Course Topics】

Theme	Class number of times	Description
Structural Planning	2	Structural Planning of civil infrastructures is introduced. The concept, significance of planning, characteristics of civil infrastructures are discussed. Practical planning process of a bridge is explained.
Modern Excellent Designs	1	The excellent examples of modern structural design are introduced from the viewpoint of the structural system and the urban design. Then the importance of integrated design of urban infrastructure as a place of human activities and how the design should be are lectured.
Structure and Form	2	The bridge types, for example, girder, truss, and arch etc. that have been regarded individually, are lectured as an integrated holistic concept from the viewpoint of the acting forces to understand the structural continuity, symmetry and the systems. Furthermore, the methods of the operation of structural form are given.
Structural Design and Performance-based Design	3	Design theory of civil infrastructures is introduced. The allowable stress design method and the limit state design method are explained. The basic of earthquake resistant design is discussed based on the dynamic response of structures. Performance-based design is also introduced.
Random Variables and Functions of Random Variables	1	Fundamentals of random variables, functions of random variables, probability of failure and reliability index in their simplest forms are lectured.
Structural Safety Analysis	3	Limit states, probability of failure, FOSM reliability index, Hasofer-Lind reliability index, Monte Carlo method are lectured.
Design Codes	2	Code format as Load and Resistance Factors Design (LRFD) method, calibration of partial safety factors based on the reliability method are given.

【Textbook】Reliability of Structures, A. S. Nowak & K. R. Collins, McGraw-Hill, 2000 (for T. Utsunomiya)
【Textbook(supplemental)】U.Baus, M.Schleich, "Footbridges", Birkhauser, 2008（Japanese ver.: "Footbridges"(translated by Kubota, et al.), 鹿島出版会 , 2011）
久保田善明 , 『橋のディテール図鑑』, 鹿島出版会 , 2010
Other books will be given in the lectures as necessary.
【Prerequisite(s)】Fundamental knowledge on Probability and Statistics, and Structural Mechanics
【Web Sites】https://www.t.kyoto-u.ac.jp/lecturenotes
【Additional Information】Structural planning and design will be given by Y. Takahashi, Excellent designs and structure & forms by Y. Kubota, and Structural reliability analysis by T. Utsunomiya.

10F010

Bridge Engineering

橋梁工学

【Code】10F010 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Mon 3rd 【Location】C1-117 【Credits】2

【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Hiromichi Shirato, Kunitomo Sugiura, Tomoaki Utsunomiya, Tomomi Yagi

【Course Description】The subject matter of bridge engineering can be divided into two main parts, which are steel structure and wind loading/wind resistant structure. The aim of this course is to provide details of mechanical behaviors, maintenance and design of bridge structures. The former part of this course contains the static instability of steel structures and the problems of corrosion、fatigue、brittleness、weldability on steel bridges. In the latter part, the basics of wind engineering, bridge aerodynamics and wind-resistant design including current problems to be solved are provided are provided.

【Grading】Assessment will be based on exam, reports and attendance.

【Course Goals】

Also, the basic knowledge for wind engineering and aerodynamic instabilities, which are necessary for the wind resistant design of bridges, will be acquired.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	- Fundamental knowledge on steel structures - Types of steel structures - Future trend of steel structures
Material behavior, Initial imperfections and Damages	1	- Construction of steel structures - Residual stresses and initial deformations - Damages
Stress-strain relationship, Joints	1	- Yield surfaces - Bauschinger effect - Hardening effect - Welded joint - Bolted joint
Fatigue fracture, fatigue life and fatigue design	1	- S-N design curve - Fatigue crack growth, stress intensity factor - Miner's rule on damage accumulation - Repair of fatigue damage
Structural stability and design for buckling	1	- Structural instability and accident - Theory of Stability - Compressive members, etc.
Corrosion and anti-corrosion of steel structures	1	- Mechanism of corrosion - Micro- and Macro- cells - Anti-corrsion - Life-cycle costs
Wind resistant design of structures	2	- Natural winds due to Typhoon, Tornado and so on - Evaluation and estimation of strong winds - Wind resistant design methods - Various kinds of design codes
Aerodynamic instabilities of structures	3	- Introduction of aerodynamic instabilities (ex. vortex-induced vibration, galloping, flutter, buffeting, cable vibrations) - Mechanisms of aerodynamic instabilities - Evaluation methods and Countermeasures
Wind-induced disaster	1	- Accidents on structures due to strong winds - Disaster prevention
Topics	1	Introduction of current topics on bridge engineering by a visiting lecturer

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Basic knowledge for construction materials, structural mechanics and fluid mechanics are required.

【Web Sites】

【Additional Information】

10A019

Concrete Structural Engineering

コンクリート構造工学

【Code】10A019 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Tue 2nd

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Toyoaki Miyagawa, Takashi Yamamoto, Kei Murota (Sumitomo Mitsui Construction Co., LTD.)

【Course Description】Concrete is one of the most useful construction materials employed for an infrastructure. The structural properties of a reinforced concrete including a prestressed concrete are introduced among the various structural components of concrete. The engineering techniques in design, execution, diagnosis, repair, strengthening and management of reinforced and/or prestressed concrete structures are discussed from the point of view of the performance based system.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	5	
	5	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F227

Structural Dynamics

構造ダイナミクス

【Code】10F227 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 1st

【Location】C1-117 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Igarashi, Furukawa

【Course Description】This course deals with dynamics of structural systems and related topics, to provide the theoretical basis to deal with the problems of vibration, safety under dynamic loads and health monitoring associated with infrastructures. The students will study the dynamic response, properties of natural modes and methods of eigenvalue analysis for multi-DOF systems. The topics on the numerical time integration schemes, probabilistic evaluation of structural response to random excitation, and dynamic response control techniques for structures are also studied.

【Grading】Based on the results of a final examination, plus homework assignments

【Course Goals】(1) To aquire the knowledge on theories and principles of analysis of MDOF systems (2) Systematic understanding of frequency-domain structural response analysis

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Fudamental concepts, harmonic motion
Dynamics of Multi-Degree-Of-Freedom Systems	2	Formulation of Eq. of Motion / Lagrange's method / Normal Modes / Modal Analysis / Modeling of System Damping
Frequency-Domain Analysis of System Response	1	Frequency Response Funcs. / Fourier Transform
Numerical Time Integration	2	Formulation / Stability and Accuracy Analysis of Integration
Random Vibration	6	Overview / Probability Theory / Sequence of i.i.d. Random Variables / Concept of Random Processes / Correlation Funcs. / White Noise / Stochastic Differential Eq. / Lyapunov Eq. / Response to White Noise Excitation / Covariance Matrix Approach / Correlation Funcs. of Random Response / Spectral Representation of Random Processes / Spectral Representation of Structural Response / Application
Structural Response Control	1	Active Control / Semi-Active Control

【Textbook】Not used; Class hand-outs are distributed when necessary.

【Textbook(supplemental)】

【Prerequisite(s)】Mechanical vibration (undergraduate level), Complex calculus (integration of analytic functions, Fourier transform, etc.), Probability theory, Linear algebra

【Web Sites】https://www.t.kyoto-u.ac.jp/lecturenotes/gse/dum/dum002/

【Additional Information】

10F263

Seismic Engineering Exercise

サイスミックシミュレーション

【Code】10F263 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 4th 【Location】C1-192 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture and Exercise 【Language】Japanese 【Instructor】Sawada, Takahashi

【Course Description】This course provides the knowledge of simulation methods for earthquake engineering. Small groups of students are exercised in the prediction of ground motion generated by a specified seismic fault and the response analysis of structure selected by themselves considering soil-structure interaction.

【Grading】Based on the performance during the course (including homework) and the results of presentation and reports.

【Course Goals】At the end of this course, students will be required to have a good understanding of: - Prediction of ground motion generated by a specified seismic fault - Dynamic response analysis of structures and foundation (linear/nonlinear)

【Course Topics】

Theme	Class number of times	Description
Frequency domain analysis	1	Basics of Fourier transformation is introduced.
Modeling of structure - soil system and time domain analysis	1	Equation of motion of SR model is introduced and the integration method of the equation in time domain is explained.
Exercise of linear seismic response analysis	2	Small groups of students are exercised in elastic modeling of structures and linear response analysis in time domain and frequency domain.
Prediction of ground motion by empirical Green's function method	3	Empirical Green's function method is introduced to predict large earthquakes based on observed small earthquakes.
Seismic analysis method of soil	2	Seismic analysis method of layered half-space based on equivalent linearization method is introduced.
Nonlinear seismic analysis method of structures	2	Nonlinear modeling of structures and the integration and iterative methods of the nonlinear equation of motion in time domain are introduced.
Exercise of nonlinear seismic response analysis	3	Small groups of students are exercised in the prediction of ground motion generated by a specified seismic fault and the nonlinear response analysis of structures and foundation.

【Textbook】Not used; Class hand-outs are distributed when necessary.

【Textbook(supplemental)】

【Prerequisite(s)】Earthquake Engineering/Lifeline Engineering (10F261), Structural Dynamics (10F227)

【Web Sites】

【Additional Information】

10F415

Ecomaterial and Environment-friendly Structures

環境材料設計学

【Code】10F415 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 1st

【Location】C1-117 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Hirotaka Kawano, Atsushi HATTORI

【Course Description】Lecture on outline of impact of construntion materials to environment and influence on materials and structures from environment. Discuss how to use materials sustainably. Keywords are concrete, steel, composite materials, CO2, durability, recycle and reuse, life-cycle assessment.

【Grading】Attendance(%), Report(%),Presentation(%)

【Course Goals】To understand the limit of resources and effect of material use to environment. and to understand the basic theory to make environmental-friendly infrastructures from the view point of materials use.

【Course Topics】

Theme	Class number of times	Description
Guidance	1	Object of the Course, Grading and Goals
product of materials and impact to environment	1	Product of cement, steel, concrete CO2 product and its influence
recycle and reuse of materials	3	Recycle and reuse of steel, metals, concrete, asphalt, plastics Technology development of construction materials
deterioration of concrete structures	1	Mechanism of deterioration of concrete structures: carbonation, salt attack, alkali-aggregate reaction Maintenance and retrofit methods
deterioration of steel structures	1	Mechanism of deterioration of steel structures: corrosion, fatigue Maintenance and retrofit methods
deterioration of composite structures	1	Mechanism of deterioration of composite structures: Maintenance and retrofit methods
life-cycle assessment of structures	1	Life-cycle assessment of structures considering initial cost as well as maintenance cost
topics and discussion	2	Recent topics on construction materials and discussion
presentation by students and discussion	4	Presentation by students on the individual topics Discussion on the topics

【Textbook】No set text

【Textbook(supplemental)】Instructed in class

【Prerequisite(s)】Basic knowledge of construction materials, concrete engineering

【Web Sites】

【Additional Information】Questions and discusions are welcome

10F089

Infrastructure Safety Engineering

社会基盤安全工学

【Code】10F089 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Thu 3rd

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】To introduce students to the issues concerning the safety and reliability of infrastructures such as tunnels and bridges

【Grading】This lecture involves reports (70%) and attendance(30%)

【Course Goals】To understand the basic technologies to enhance the safety of structures. To have basic knowledge on safety engineering and be able to evaluate the safety using the obtained skills.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	
Safety of infrastructures	3	
Basics of safety engineering 1	2	
Basics of safety engineering 2	2	
Risk analysis and reliability	3	
Monitoring and safety evaluation	1	
safety of geo-structures	1	
safety of bridges	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Basic knowledge on statistics is required. Students should have taken the course of geo-mechanics, structural mechanics and concrete engineering.

【Web Sites】

【Additional Information】confirm the attendance at every lecture

10F075

Hydraulics & Turbulence Mechanics

水理乱流力学

【Code】10F075 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 3rd 【Location】C1-171 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】,

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】Nezu, I. and Nakagawa, H. : Turbulence in Open-Channel Flows, Balkema,

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A216

Hydrology

水文学

【Code】10A216 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 2nd 【Location】C1-172
【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese
【Instructor】Michiharu SHIIBA and Yasuto TACHIKAWA
【Course Description】Physical mechanisms of the hydrologic cycle are described from the engineering viewpoint. The rainfall-runoff modeling and its prediction method are emphasized. Physical hydrological processes explored are surface flow, saturated-unsaturated subsurface flow, groundwater flow, streamflow routing, and evapotranspiration. Physical mechanism of each hydrological process and its numerical modeling method are explained, and the basic equations and numerical simulation methods are provided. Then, distributed hydrological modeling which incorporate various hydrological processes and a lumping method of distributed hydrological model are explained.
【Grading】Examination and report
【Course Goals】The goals of the class are to understand the physical mechanism of hydrological processes, their basic equations, and numerical simulation methods.
【Course Topics】

Theme	Class number of times	Description
Introduction	1	The hydrologic cycle and the hydrological processes are explained.
Surfaceflow	2	The physical process of the surface flow and its numerical modeling method are described. The basic equations of the surface flow and the numerical simulation methods are explained.
Saturated-unsaturated subsurface flow	2	The physical process of the saturated-unsaturated subsurface flow and its numerical modeling method are described. The basic equations of the saturated-unsaturated subsurface flow and the numerical simulation methods are explained.
Groundwater flow	2	The physical process of the groundwater flow and its numerical modeling method are described. The basic equations of the groundwater flow and the numerical simulation methods are explained.
Streamflow routing	2	The physical process of the streamflow routing and its numerical modeling method are described. The basic equations of the streamflow routing and the numerical simulation methods are explained.
Evapotranspiration	2	The physical process of the evapotranspiration and its numerical modeling method are described. The basic equations of the evapotranspiration and the numerical simulation methods are explained.
Channel network and watershed modeling	1	Numerical representations of channel networks and catchments are explained.
Distributed hydrological model	1	A physically-based distributed hydrological model is described, which is constructed with numerical representations of channel networks and catchments.
Lumping of flow, parameter and watershed model	1	Lumping methods of a distributed hydrological model are described, which include lumping of flow, parameter and watershed model.

【Textbook】Handouts are distributed at each class.
【Textbook(supplemental)】
【Prerequisite(s)】Basic knowledge of hydraulics and hydrology
【Web Sites】http://hywr.kuciv.kyoto-u.ac.jp/lecture/lecture.html
【Additional Information】

10F019

River Engineering and River Basin Management

河川マネジメント工学

【Code】10F019 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 1st 【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Hosoda, Kishida

【Course Description】It is important to consider about rivers comprehensively in view of the various aspects based on natural science and engineering. The fundamental knowledge to consider rivers and make the plans of river basins is explained with the following contents: various view points to consider rivers, long term environmental changes of rivers and its main factors, river flows and river channel processes, ecological system of rivers and lakes, flood disasters, integrated river basin planning(flood defence, environmental improvement planning, sediment transport system), functions of dam reservoir and management

【Grading】reports, attendance

【Course Goals】to learn the fundamental knowledge and grounding to consider rivers from the various points of view such as natural science, engineering and social science.

【Course Topics】

Theme	Class number of times	Description
Various view points on rivers and river basins	1	Various viewpoints and river basins, Various rivers on the earth, Formation processes of river basins, long term environmental changes of rivers and its main factors
Ecological system in rivers	1 ～ 2	Fundamental knowledge on river eco-system
Application of computatinal methods to environmental problems	2	Numerical analysis of the environmental change in Lake Biwa, Flood flows and river channel processes
Recent flood disasters & Integrated river basin planning	2	Characteristics of recent flood disasters, River law, Fundamental river management plan, River improvement plan, Procedures of flood defense planning, Flood invasion analysis and hazard map
Groundwater and its related field	2	Simulation technology of groundwater, Geo environmental issues, Reservoir Engineering, Contaminant Transport Processes
Sustainable development of dam	2	Needs of dam development and history of dam construction
Water quality of reservoir	1	Environmental fluid behavior on reservoir, Water quality and its maintenance of reservoir
Economic evaluation of environmental improvement projects	1	Evaluation of people's consciousness for river improvement works by means of CVM, Conjoint Analysis, etc.
Dam structure and maintenace	1	Dam structure, foundation, grouting, and maintenance
Special Lecture	1-2	Expert engineer and/or office on the river Engineering and river basin management will be invited.

【Textbook】Printed materials regarding the contents of this class are distributed in class.

【Textbook(supplemental)】

【Prerequisite(s)】Fundamental knowledge of Hydraulics, Hydrology and Ecology

【Web Sites】

【Additional Information】Students can contact with professors by visiting their rooms and sending e-mail.

10A040

Sediment Hydraulics

流砂水理学

【Code】10A040 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 2nd 【Location】C1-171 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Hitoshi Gotoh and Eiji Harada

【Course Description】Natural flows in river and coast are movable bed phenomena with the interaction of flow and sediment. At a river and a coast, a current and a wave activate a sediment transport and bring the topographical change of a bed such as sedimentation or erosion. This lecture provides an outline about the basics of sediment (or movable bed) hydraulics, and detail of the computational mechanics of sediment transport, which has been developed on the basis of dynamics of flow and sediment by introducing a multiphase flow model and a granular material model. Furthermore, about sediment and water-environment relationship, some of frontier technologies, such as an artificial flood, removal works of dam sedimentation, coastal protection works, and sand upwelling work for covering contaminated sludge on flow bottom etc., are mentioned.

【Grading】Grading is based on student’s activities in lectures and final reports.

【Course Goals】Students understand the basics of sediment hydraulics and outline of advanced models for computational sediment hydraulics, such as multiphase flow model and granular material model. Students understand the present conditions of sediment control works.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	The purpose and constitution of the lecture, the method of the scholastic evaluation are explained.
Basics of sediment hydraulics	4	Physical characteristic of a movable bed and a non-equilibrium sediment transport process and its description are explained. Furthermore, the prediction technique of topographical change due to current and waves is outlined.
Computational mechanics of sediment transport: The state of the art	7	Essential parts of numerical models of the movable bed phenomena, which has been developed by introducing dynamic models such as a granular material model to describe a collision of sediment particles and a multiphase flow model to describe a fluid-sediment interaction, are described. In comparison with the conventional movable bed computation, the points on which has been improved to enhance the applicability of the models are concretely mentioned. Some frontier studies of sediment transport mechanics are also introduced.
Planning and management of movable bed flows	1	The concept of new Japanese Seacoast Law is explained. New works of coastal protection with consideration of an environmental aspect (including improvement of habitat of coastal creatures) are mentioned with focusing physics behind them.

【Textbook】Hitoshi Gotoh: Computational Mechanics of Sediment Transport, Morikita Shuppan Co., Ltd., p.223, 2004 (in Japanese).

【Textbook(supplemental)】Non

【Prerequisite(s)】Undergraduate-level Hydraulics or Hydrodynamics is required. Because a commentary easy as possible is kept in mind by lectures, students without these prerequisite are welcomed.

【Web Sites】Non

【Additional Information】Non

10F462

Coastal Wave Dynamics

海岸波動論

【Code】10F462 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Hitoshi Gotoh, Eiji Harada, Khayyer Abbas and Kazuya Oki

【Course Description】Wave motion, which is the main driving force in coastal zone, is explained focusing on wave transformation theory and computational fluid dynamics, and design for coastal structures of their engineering applications is illustrated. As for the computational fluid dynamics for waves, methodology of free-surface wave based on the Navier-Stokes equation, which has been significantly developed in recent years, is explained in detail.

【Grading】Grading is based on usual students activities in lectures and reports.

【Course Goals】Goal of this course is a detailed understanding of fundamental of wave transformation theory and computational fluid dynamics related to wave motion, and is also acquiring a design concept for coastal structures as their engineering applications.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	The purpose and constitution of the lecture the method of the scholastic evaluation are explained.
Conservation laws of fluid	1-4	Fundamentals of fluid mechanics, liner / non-liner wave theories and numerical mathematics are explained.
Modeling of surf zone dynamics	1-7	Several methodologies against free-surface wave including breaking waves (i.e. VOF, MPS, SPH) are illustrated. Especially advanced approaches of MPS and SPH are explained in detail.
Introduction of turbulence models	1	Reynolds averaging models and large eddy simulation are outlined.
Modeling of rock mound dynamics	1-2	Method for tracking of armor blocks under high waves using Distinct Element Method is described.

【Textbook】Non

【Textbook(supplemental)】Non

【Prerequisite(s)】Non. It is desiarable to have knowledge about hydraulics, fluid mechanics.

【Web Sites】

【Additional Information】If there are any questions, please send e-mail to the staff.

10F267

Hydro-Meteorologically Based Disaster Prevention

水文気象防災学

【Code】10F267 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Mon 4th

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	1	
	2	
	2	
	2	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A222

Water Resources Systems

水資源システム論

【Code】10A222 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd 【Location】C1-192 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	1	
	1	
	2	
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F077

River basin management of flood and sediment

流域治水砂防学

【Code】10F077 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 1st

【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】(DPRI) Nakagawa, H., (DPRI) Sumi, T., (DPRI) Takebayashi, H. and (DPRI) Kawaike, K.

【Course Description】In a river basin, various kinds of disasters such as debris flow, land slide, flood inundation, storm surge, and etc. sometimes happen from the origin to the mouth. This lecture presents occurrence examples, mechanisms, theory and methods of prediction and prevention/mitigation methods against those disasters. Also this lecture mentions comprehensive management in a sediment routing system focusing on sediment management strategy in dam reservoirs.

【Grading】Grading is based on 2 reports out of 4 topics and attendance.

【Course Goals】The goals of the class are to understand phenomena within a river basin and to have wide knowledge of problems of flood and sediment disasters and countermeasures against them.

【Course Topics】

Theme	Class number of times	Description
About Sabo Works	4	About Sabo works, sediment disasters, countermeasures against sediment disasters, Sabo projects.
About Reservoir Sediment Management	3	Reservoir sediment management focusing on reservoir sustainability and comprehensive management in a sediment routing system is overviewed including worldwide perspective and Japanese advanced case studies.
About basin-wide sediment routing	3	About the one dimensional bed deformation analysis and the sediment runoff model are introduced. Furthermore, some examples of the application of those models are introduced.
About basin-wide flood management	4	Flood disasters and countermeasures against them are overviewed along the history of flood management in Japan.

【Textbook】No designation. Printed materials regarding the contents of this class are distributed in class.

【Textbook(supplemental)】Instructed in class

【Prerequisite(s)】Fundamental knowledge of Hydraulics and river engineering

【Web Sites】

【Additional Information】

10F011

Computational Fluid Dynamics

数値流体力学

【Code】10F011 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 4th 【Location】【Credits】2【Restriction】No Restriction【Lecture Form(s)】Lecture【Language】English【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	6	
	6	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F065

Hydraulic Engineering for Infrastructure Development and Management

水域社会基盤学

【Code】10F065 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Tue 3rd

【Location】C1-117 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Nezu Iehisa, Shiiba Michiharu, Hosoda Takashi, Gotoh Hitoshi, Tachikawa Yasuto, Kisihida Kiyoshi, Harada Eiji, Sanjou Michio and Kim Sunmin

【Course Description】This lecture picks up various water-related problems and provides their explanation and solution methodology related to hydrodynamic and hydrological infrastructure improvements, maintenance, disaster prevention against flood and damage of water environment, interweaving several leading-edge cases in the real world. Turbulent flow and CFD, sediment transport system and design/planning of hydraulic structure are described on the basis of the integrated management of river-and-coast systems with sediment control and these relationship with infrastructure improvement. Perspective from the viewpoint of public environmental infrastructure on water environment is presented.

【Grading】Grading is based on students activities in lectures and reports.

【Course Goals】Students learn about case-based practical solutions against various problems related to hydraulic engineering, and students acquire academic preparation of how to approach to public environmental infrastructure on water area.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	The purpose and constitution of the lecture, the method of the scholastic evaluation are explained.
Turbulence phenomena in open-channel flows	3	Several problems and exciting topics related to turbulence phenomena in open-channel flows are discussed with advanced practical examples.
River basin management	3	Introduction of flood disasters during a few decades in the world, flood control planning in Japan, Economic evaluation and analysis of people’s awareness to river improvement projects with dam construction.
Beach erosion	3	Several problems and their solution methodology against sediment transport process in coastal zone are explained. Advanced approaches for sediment control are overviewed.
Rainfall-runoff prediction and hydrologic design	3	Water resources issues related to rainfall-runoff prediction and hydrologic design are discussed with advanced practical examples.

【Textbook】Non

【Textbook(supplemental)】Non

【Prerequisite(s)】hydraulics, fluid mechanics, river engineering, coastal engineering, hydrology, etc.

【Web Sites】Non

【Additional Information】Non

10F100

Applied Hydrology

応用水文学

【Code】10F100 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 4th

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Tohiharu Kojiri, Tomoharu Hori, Tetsuya Sumi, Yoshitaka Kido, Yasuhiro Takemon, Kenji Tanaka

【Course Description】Applied and integrated approach to the problems closely related to the water circulation system, such as floods, droughts, water contamination, ecological change, and social change is introduced mainly from the hydrological viewpoint with reference to water quantity, quality, ecological and socio-economic aspects. In the course, several actual water problems are taken up and solving process of each problem which comprises of problem-identification and formulation, impact assessment, countermeasures design and performance evaluation is learned through the lectures ’ description and also investigation and discussion among the students.

【Grading】Grading is based on student activities in lectures, presentation and reports

【Course Goals】To obtain fundamental Knowledge and skills to perform problem definition, survey amd countermeasure design on problems about water use, water hazard mitigation and water environment.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Target fields and characteristcis of Hydrology and Applied Hydrology
Modeling of hydrologic cycle process	2	Modelking of hydrologic processes and relation to human society
Assessment of climate change effects	2	Impact of global warming and climate change on hydrologic cycle and water use environment
Water resources system	2	interaction between water resources and socio-economic systems, distributed flood risk assesment and countermeasures design from hhuman security viewpoint
Reservoir system and its sustainability	2	Asset management of dam reservoirs for their sustainability, Basinwide sedimant management and reservoir operation
Ground water system	2	Basin scale water quiality analysis, Modeling of ground water system
Ecosystem management	2	Habitat structure assessment for stream ecosystem
Presentation	1	
Report	1	

【Textbook】Printed materials on the contents of this class are distributed in class.

【Textbook(supplemental)】None

【Prerequisite(s)】Elementary knowledge of hydrology and water resources engineering.

【Web Sites】

【Additional Information】

10F103

Case Studies Harmonizing Disaster Management and Environment Conservation

環境防災生存科学

【Code】10F103 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 4th 【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture 【Language】English

【Instructor】K. TAKARA(DPRI), H. NAKAGAWA(DPRI), E. NAKAKITA(DPRI), H. MASE(DPRI), N. MORI(DPRI), Y. YAMASHIKI(DPRI)

【Course Description】Environmental impacts by infrastructure for disaster prevention and mitigation are discussed. Introducing various examples of natural disasters, degradation of the environment, and harmonizing disaster management and environmental conservation in the world, this classroom carries on a dialogue about effective measures for reducing negative environmental impacts and serious disasters.

【Grading】Considering both the number of attendances and the score of final test at the end of the semester.

【Course Goals】Conservation of the environment and prevention/mitigation of natural disasters, which are very important for human's survivability, often conflict with each other. This course introduces various examples. Students will learn many examples harmonizing these two issues, and shall consider technical and social countermeasures fitting to the regional characteristics.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Introduction
Disaster due to heavy rainfall -- utilization of weather radar and global climate change	3	Disaster due to heavy rainfall -- utilization of weather radar and global climate change
Flood disaster prevention and the environment	2	Flood disaster prevention and the environment
River environment and disaster management	2	River environment and disaster management
The environment of closed water areas / Atmosphere-ocean climate interaction	2	The environment of closed water areas / Atmosphere-ocean climate interaction
Coastal disasters due to tsunamis and storm surges	2	Coastal disasters due to tsunamis and storm surges
Projection of climate and coastal environmental change	2	Projection of climate and coastal environmental change

【Textbook】No particular textbook for this course. Necessary documents and literature introduction are provided in the class room from time to time.

【Textbook(supplemental)】Some literature would be introduced by professors.

【Prerequisite(s)】No special knowledge and techniques are necessary, but requires reading, writing and discussing in English in the class.

【Web Sites】

【Additional Information】Contact Prof. Takara at <takara.kaoru.7v@kyoto-u.ac.jp> if you have any query.

10F106

Integrated Disasters and Resources Management in Watersheds

流域管理工学

【Code】10F106 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 1st

【Location】Katsura Campus, Ujigawa Open Laboratory, Shirahama Oceanographic Observatory and Hodaka Sedimentation Observatory

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture and Exercise 【Language】English

【Instructor】Keiichi TODA(DPRI), Masaharu FUJITA(DPRI), Tetsuya HIRAISHI(DPRI), Nozomu YONEYAMA(DPRI), Kenji KAWAIKE(DPRI), Hiroshi TAKEBAYASHI(DPRI), Daizo TSUTSUMI(DPRI)

【Course Description】Mechanism and countermeasures of sediment disasters, flood disasters, urban flood disasters and coastal disasters are explained. An integrated watershed management of these disasters and water/sediment resources is also introduced. This lecture will be open at Katsura Campus, Ujigawa Open Laboratory, Shirahama Oceanographic Observatory and Hodaka Sedimentation Observatory. Students attending this lecture must take one of the intensive experiment/field study courses offered in Ujigawa Open Laboratory and these observatories.

【Grading】Presentation, Discussion and Report

【Course Goals】Learn an integrated basin management system for natural disasters (sediment disasters, food disasters, coastal disasters, urban flood disasters) mitigation and water/sediment resources utilization considering environmental conservation.

【Course Topics】

Theme	Class number of times	Description
Urban flood disaster managemnet	2	We review urban floods from the viewpoint of river basins, flood causes, and features, together with the results of recent studies. Based on these studies, we propose comprehensive measures against urban floods, including underground inundations. In addition, we discuss on prediction methods of the tsunami disaster in urban area.
Flood disaster management	2	Prevention / mitigation measures against flood disasters and flood prediction methods are explained as well as examples of recent flood disasters in Japan.
Sediment disaster management	2	Showing the problems on sediment disasters and sediment resources, I explain an integrated sedimnet management system both for sediment disasters and sediment resources.
Coastal disaster management	2	Coastal erosion and tsunami hazard become remarkable in these days in Japanese coast. In a lecture, we discuss on characteristics of such coastal disasters.
Exercise on flood disaster at Ujigawa Open Laboratory (Selective)	集中２日間	Experiment and analysis on debris flows, riverbed variation and flooding at Ujigawa Open Laboratory, Fushimi-ku, Kyoto city.
Exercise on sediment related disaster at Hodaka Sedimentation Observatory (Selective)	集中２日間	The Hodaka Sedimentation Observatory is located at Okuhida region, Gifu Prefecture. In the field exercise, observation methods of rainfall-runoff and sediment movement processes will be explained. Field investigations into several types of erosion control facilities, sediment producing sites, debris flow sites and sediment related disaster sites will be carried out.
Exercise on coastal disaster at Shirahama Oceanographic Observatory (Selective)	集中２日間	The Sirahama Maritime Observatory is located in Wakayama Prefecture. In the lecture, observatory, waves, currents and tide levels monitoring system is demonstrated.

【Textbook】None

【Textbook(supplemental)】None

【Prerequisite(s)】Hydraulics, River Engineering, Coastal Engineering, Sediment Transport Hydraulics

【Web Sites】

【Additional Information】

10F025

Geomechanics

地盤力学

【Code】10F025 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 3rd 【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K016

Computational Geotechnics

計算地盤工学

【Code】10K016 【Course Year】 【Term】2nd term 【Class day & Period】Fri 2nd 【Location】C1-172

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	4	
	2	
	1	
	4	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F057

Principles of Geotechnics

地盤工学原論

【Code】10F057 【Course Year】 【Term】2nd term 【Class day & Period】Thu 1st 【Location】C1-173

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	6	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F237

Management of Geotechnical Infrastructures

ジオマネジメント工学

【Code】10F237 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 4th

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Ohtsu, Kishida, Shiotani

【Course Description】Advanced monitoring and management techniques not only during construction stage but maintenance stage in geo- or rock-infrastructures are lectured systematically.

【Grading】Attendance(10%), Report(30%), Examination(60%)

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Guidance	1	Guidance Introduction of Geo-Asset Management
Geotechnical survey	5	Introduction of geotechnical survey, Geophysical exploration, Inversion technique, Practical works of field measurements
Probability theory	4	B/C on project, Project risk management, Basic of probability theory, Introduction of contract and Int'l construction project
Innovative monitoring techniques	4	Applications of geo and rock monitoring, Advanced NDT, Applications of cutting-edge fields

【Textbook】Hiroyasu Ohtsu, Project Management, Corona Publishing, 2010. (in Japanese)

【Textbook(supplemental)】C. Chapman and S. Ward, Project Risk Management, John Wiley & Sons, 1997.
R. Flanagan and G. Norman, Risk Management and Construction, Blackwell Science
V.M. Malhotra & N.J. Carino, CRC Handbook on Nondestructive Testing of Concrete, CRC Press, 1989.

【Prerequisite(s)】

【Web Sites】

【Additional Information】Addtional information is available by visiting the following professors. Appointment shall be made in advance by e-mail.
Ohtsu@toshi.kuciv.kyoto-u.ac.jp
kishida.kiyoshi.3r@kyoto-u.ac.jp
shiotani.tomoki.2v@kyoto-u.ac.jp

10F241

Construction of Geotechnical Infrastructures

ジオコンストラクション

【Code】10F241 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Fri 1st

【Location】C1-171 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Kimura, Kishida

【Course Description】Advanced construction technology of geo infrastructures, such as tunnel, large underground cavern, foundation, culvert, retaining wall, is introduced and explained. And, the practical projects applied by the advanced construction technology are also introduced.

【Grading】Attendace (20%), Report (80%)

【Course Goals】To learn to the advanced construction technology and to propose the project and design through the advanced construction technology.

【Course Topics】

Theme	Class number of times	Description
Guidance, Introduction of construction of geotechnical infrastructures	1	Guidance, Introduction of construction of geotechnical infrastructures
Underground cavern	2	Stability of underground cavern,
Auxiliary mthods of mountain tunnel	2	Role of auxiliary methods, Auxiliary method for safety in tunnel constrcution, Axiliary methods for preservation of the surrounding environment
Undergorund space project	2	Introduce two special projects of underground space, namely, nuclear waste disposal, and Carbon Capture and Storage
Field visit or special lecture	1	Visit the construction field or invite special lecture who is the expert engieer on the construction of geotechnical infrastructures.
Foundation	2	Design and construction of piles foundation and steel pipe sheet piles
Culvert	2	Design and construction of box type and arch type culverts
Retaining wall	2	Design and construction of retaining wall

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Soil mechanics, Rock mechanics

【Web Sites】

【Additional Information】Office hour will be explained at the guidence. Students can contact with professors as an e-mail. kimura@icc.kyoto-u.ac.jp kishida.kiyoshi.3r@kyoto-u.ac.jp

10F242

Geo-Risk Engineering

ジオリスクエンジニアリング

【Code】10F242 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 3rd

【Location】 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Ohtsu, Shiotani, Kishida

【Course Description】This lecture aims to provide interdisciplinary knowledge associated with geo-risk engineering, the topics of risk analysis focusing on geotechnical structures. In detail, the contents of lectures consist of following topics: Introduction of risk analysis, Mathematical background of geo-risk evaluation, Examples of risk evaluation mainly focusing on slopes and Risk management on road slopes.

【Grading】Participation (10), Presentation (50), Report (40)

【Course Goals】Acquire the necessary knowledge of risk engineering to construct and maintain infrastructures.

【Course Topics】

Theme	Class number of times	Description
Guidance	1	Guidance & Introduction
Geo-risk	9	Basic Concept of Geo-Risk Engineering Introduction of Risk Analysis Mathematical Background of Geo-Risk Evaluation Basic Concept of Road Infrastructure Risk Evaluation Management from Macroscopic Viewpoint Management from Microscopic Viewpoint Slope failure early warning system
Risk assessment	2	Case studies of Risk Based Assessment Management by Means of Risk Assessment
Risk for underground structures	2	Risk Management of underground sequestration of Radioactive waste and anthropogenic CO2

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Addtional information is available by the following lecturer. To meet the lecturer, appointment shall be made in advance.

Prof. Hiroyasu Ohtsu
email: ohtsu@toshi.kuciv.kyoto-u.ac.jp

10F405

Fundamental Geofront Engineering

ジオフロント工学原論

【Code】10F405 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 2nd 【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】S.Nishiyama,T.Koyama,K.Ando,T.Takemoto

【Course Description】This lecture aims to learn a practical knowledge associated with mechanical and hydraulic problems in rock masses to realize environment-friendly development of underground space through exercise in modelling and analytical study of rock mass.

【Grading】Problem sets will be given almost every week and due one week later in class. You can work together but must turn in your own solutions.

【Course Goals】This course is designed to give students knowledge and understanding to recognise and apply the fundamental techniques used in engineering rock mechanics for the analysis of underground engineered structures.

【Course Topics】

Theme	Class number of times	Description
Introduction to rock mechanics and rock engineering	1	Introduction to common geophysical investigation methods and field investigation methodology.
Rock mass behaviour around excavations	1	How to apply popular failure criteria to determine the strength of both intact rock and discontinuities. How to assess the geometry of discontinuous rock masses using customary measures and techniques
Rock strength and rock mass classification	2	Rock construction techniques for rock foundation works and also for construction of rock caverns and tunnels. Proposals for support of strength and running of construction works in rocks based on conceptual engineering geological models, assessment of the Q-value and of the mechanical characteristics of the rock mass.
Underground excavations in discontinuous and stratified rock	2	Basic rock geology emphasizing characteristics of rocks, in particular structural features and the importance of discontinuities in rock construction works.
Computer methods in rock mechanics and rock engineering:	2	Introduction to computer programmes for underground space design, rock mechanics, and environmental control.
Hydrogeology and groundwater flow in geotechnical	2	The influence of the groundwater conditions on the characteristics of the rock mass, in particular concerning strength and stability but also rock construction technique and environmental consequences.
Risk assessment and risk management	1	Risk assessment processes in rock engineering and management principles with respect to the environment.

【Textbook】Handout will be distributed.

【Textbook(supplemental)】References are indicated in the handout.

【Prerequisite(s)】Undergraduate courses in geology, geotechnical engineering,and soil mechanics.

【Web Sites】

【Additional Information】

10F407

Environmental Design in Geo-front Engineering

ジオフロント環境デザイン

【Code】10F407 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Wed 2nd 【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】S.Nishiyama,T.Koyama,Y.Ijiri,M.Wada

【Course Description】Practical projects of geo-risk management, advanced measurement method and groundwater environmental-assessment system associaeted with utilization and environmental conservation of underground space are introduced and explained in this lecture.

【Grading】Problem sets will be given almost every week and due one week later in class.
You can work together but turn in your own solutions.

【Course Goals】This course is intended to give students a basic understanding of the theoretical and empirical principles of underground spacce development.
This course will provide the analytical background for students to understand the design principles used in disposal of radioactive Waste project and subsurface CO2 disposal project.

【Course Topics】

Theme	Class number of times	Description
Introduction to underground development	1	Introduction to rock mechanics and rock engineering.
Rock mechanics for underground development	1	Fundamental definitions, historical underground development, underground development art and engineering.
Construction of underground structures	3	Influence of rock strength on excavation, influence of undeground space size, ground support drilling and blasting, mechanism of rock breakage, tunnelling progress with drill and blast excavation.
Hydraulic engineering in underground development	4	Geologic formation as aquifers, , groundwater flow in unsaturated zones and fractured media, hydro-geologic investigation, 3-D general flow equations and advection diffusion equation, groundwater modeling, etc.
Geo-risk engineering	2	Risk identification, risk qualification analysis, risk response, and topics in risk engineering.
Examples of underground development projects	2	Study on underground-space use and construction case studies.

【Textbook】Handout will be distributed.

【Textbook(supplemental)】References are indicated in the handout.

【Prerequisite(s)】Undergraduate courses in geology, geotechnical engineering, and soil mechanics.

【Web Sites】

【Additional Information】

10A055

Environmental Geotechnics

環境地盤工学

【Code】10A055 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 1st

【Location】C1-171 / Bldg.No.3-W3 (Yoshida Campus) 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Takeshi Katsumi and Toru Inui

【Course Description】Strategic and interdisciplinary approaches are vital to solving the global environmental problems. Previous achievements in the research field of Geotechnics have a great potential to contribute helpful solutions to these problems. This course describes the geotechnics to solve the typical geoenviroumental issues including soil & groundwater contamination, geoenvironmental impacts of construction works, and waste management & disposal.

【Grading】Continuous assessment including attendance, some assignments, and final report

【Course Goals】Students should understand the geotechnics to solve the following geoenvironmental issues; soil & groundwater contamination, waste disposal and waste utilization, and extend this knowledge to the development of concepts and technologies for creating and preserving the geo-environment.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Introduction to Environmental Geotechnics, including goals, outline and grading policy of the course
Environmental impacts of construction works	2	Mechanisms and remediation of geoenvironmental problems and geo-disasters caused by construction works
Fundamentals and remediation of soil and groundwater contamination	4	Behaviors of contaminants in subsurface Mechanisms of soil and groundwater contamination Remediation of soil and groundwater contamination Case histories
Geotechnics on waste disposal	4	Functions and structures of waste containment facilities Geotechnics on the liner system (Geosynthetics, clay liner, Leachate collection layer) Post-closure utilization of waste landfill
Geotechnical utilization of waste materials	3	Engineering properties of recycled materials in geotechnical applications (Incineration ashes, coal ash, surplus soils, dredged soils) Geoenvironmental impact assessment and control of waste utilization Case histories

【Textbook】Not specified.

Several technical papers related to the course will be distributed.

【Textbook(supplemental)】Handbook of Geoenvironmental Engineering (Asakura Publishing, ISBN: 9784254261523)

Introduction to Environmental Geotechnics (Japanese Geotechnical Society, ISBN: 9784886444196)

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F109

Disaster Prevention through Geotechnics

地盤防災工学

【Code】10F109 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】C1-117 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Susumu Iai and Mamoru Mimura

【Course Description】The lecture covers geo-hazards, including settlements due to consolidation of clayey ground and seismic hazards to geotechnical structures. In particular, the lecture covers mechanism, failure modes, and mitigation measure to geo-hazards. The lecutre ranges from mechanics of granular materials to numerical simulation.

【Grading】Based on reports to excercises and attendance.

【Course Goals】Successful students will have the ability to initiate their own research work on geo-hazards based on the solid understanding of the mechanics of granular materials and numerical analysis.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Learn Objective, contents, and grading procedure
Fundamentals of continuum mechanics for geotechnics	1	Learn fundamentals of continuum mechanics for geotechnics, including stress, strain, and equilibrium equations
Elasticity and plasticity	1	Learn plasticity, including constitutive equations, failure function, hardening function, Drucker's postulate, and associated law
Behavior of geo-materials and modeling	3	Learn constitutive equations, including (1) Cam-clay model based on energy relation, (2) visco-plastic model, and (3) model with super- and sub-loading surfaces.
Application to boundary value problems	1	Learn application of the constitutive models in geotechnical engineering.
Fundamentals of dynamics	3	Learn fundamentals of dyanamics for numerical analysis of geo-hazards during earthquakes
Mechanics of granular materials	3	Learn granular materials subject to transient and cyclic loads

【Textbook】handouts

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10X313

Governance for Regional and Transportation Planning

地域・交通ガバナンス論

【Code】10X313 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Tue 4th 【Location】C1-171 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】English 【Instructor】KOBAYASHI Kiyoshi

【Course Description】This lecture aims to provide interdisciplinary knowledge associated with appropriate governance strategies for regional, urban, transportation planning. In detail, the contents of lectures consist of following topics: Urban development management based upon PPP, landscape design to support activities, public transportation system for sustainable growth, urban facilities planning considering the variety in behaviors, ITS to support highly-advanced transportation behavior, advanced logistic system, and remote sensing technology for urban and regional planning

【Grading】Participation (10), Presentation (50), Report (40)

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Introduction of Urban Infrastructure Management	1	
Trust formation and Community Governance	1	
Strategic Complementarity in Transportation Market	1	
Compact city and the governance for cities	2	
Concepts and visions for city logistics	2	
Expectations for ITS and issues	1	
Activity model and transportation management	1	
An evaluation of the proposed symbolic guide signs at intersections	1	
Urban Design Considering Amenity in the River-Front	1	
Remote Sensing for urban planning	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

Public Finance

公共財政論

【Code】10F203 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Mon 3rd

【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Kobayashi, Matsushima

【Course Description】The concept of public finance will be taught based upon the framework of Macro economics.

【Grading】Final Exam: 60-70%
Mid-term Exam and Attendance: 30-40%

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Introduction	1	
GNP and Social Accounting	2	
AD-AS Model	3	
IS-LM Model	2	
Monetary Policies	2	
International Economics	2	
Economic Growth Model	2	

【Textbook】

【Textbook(supplemental)】Dornbusch et al., Macroeconomics 10th edition, Mcgrow-hill, 2008

【Prerequisite(s)】Basic Microeconomics

【Web Sites】will be notified in the first class.

【Additional Information】

10F207

Urban Environmental Policy

都市社会環境論

【Code】10F207 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Mon 2nd

【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Dai Nakagawa and Ryoji Matsunaka

【Course Description】This lecture aims to learn urban environmental policy and its fundamental theory and methodology to solve social and environmental problems that occur in urban area as well as to understand the structure of these problems.

【Grading】evaluation by commitment, tests, reports and examination

【Course Goals】to understand the structure of social and environmental problems in urban area and urban environmental policy, its fundamental theory and methodology to solve the problems

【Course Topics】

Theme	Class number of times	Description
Outline	1	
Structure of urban problems	3	Expansion of urban areas, Increase of Environmental impact, Making compact cities
Basic theory of transportation and environment	2	Downtown activation, Road space re-allocation, Pedestrianisation
Road traffic and Public transportation	2	Characteristics of traffic modes, Light Rail Transit, Bus Rapid Transit, Mobility Management
Fundamental theory for measurements of environmental values	3	Utility, Equivalent Surplus, Compensating Surplus
Methodology to measure environmental values	3	Travel Cost Method, Hedonic Approach, Contingent Valuation Method, Conjoint Analysis

【Textbook】No textbook

【Textbook(supplemental)】

【Prerequisite(s)】basic knowledge of public economics is required

【Web Sites】

【Additional Information】

10F213

City Logistics

シティロジスティクス

【Code】10F213 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Wed 3rd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F219

Quantitative Methods for Behavioral Analysis

人間行動学

【Code】10F219 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 5th

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	1	
	1	
	1	
	3	
	1	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F215

Intelligent Transportation Systems

交通情報工学

【Code】10F215 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Fri 2nd 【Location】C1-173
【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese
【Instructor】N. Uno and T. Yamada
【Course Description】This class provides you with the outlines of engineering methodology with information and communication technology as its core element for improving the safety, efficiency and reliability of traffic and transportation systems and reducing the environmental burden. Concretely, we discuss the applicability of countermeasures, such as Travel Demand Management, modal-mix in transportation systems, traffic safety improvement schemes for relieving contemporary problems in traffic and transportation systems, in addition to brief introduction of innovative approaches to collect high-quality of real-time traffic data. Moreover, the methodology for policy evaluation and the related basic theory are explained.
【Grading】Final report: 50-60%, Mid-term report: 30-40% and Attendance: 10%
【Course Goals】Goal of this class is to cultivate basic and critical abilities of students for implementing effective traffic and transportation management using ITS (Intelligent Transportation System).
【Course Topics】

Theme	Class number of times	Description
Basics for Transportation Network Analysis	1	
Estimation of OD Traffic Volume using Observed Link Traffic Counts	1	
Analytical Approaches Based on Transportation Network Equilibrium	3	
Outlines of ITS	1	
Traffic Management for Enhancing Efficiency	2	
Innovative Approaches for Data Collection Using ICT	1	
Application of ITS for Enhancing Traffic safety	1	
Travel Demand Management and Congestion Charging	2	
Application of Traffic Simulation	2	

【Textbook】
【Textbook(supplemental)】
【Prerequisite(s)】
【Web Sites】
【Additional Information】

10A806

Advanced Geoinformatics

空間情報論

【Code】10A806 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 2nd 【Location】C1-117 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture & Exercise 【Language】Japanese 【Instructor】Masayuki Tamura, Junichi Susaki

【Course Description】Geoinformatics is the science and technologies dealing with spatially distributed data acquired with remote sensing, digital photogrammetry, global positioning system, etc, to address the problems in natural phenomena or human activities. This lecture particularly focuses on satellite remote sensing and explains the theory and the technologies for analyzing environmental changes or disaster effects. A free software "MultiSpec" is used in exercises to learn the basic techniques of image processing.

【Grading】Grading is based on the achievements in home works given in every lesson.

【Course Goals】To understand the basic theory and to acquire the basic techniques of satellite remote sensing for observation and analysis of environmental changes and disaster effects.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	1. Introduction to remote sensing 2. Applications in environmental and disaster prevention fields
Classification of electromagnetic waves and satellite sensors	1	1. Classification of electromagnetic waves 2. Basic terms on electromagnetic radiation 3. Theory of electromagnetic radiation from objects 4. Classification of satellite sensors by observation wavelengths
Interaction of electromagnetic waves with earth surfaces	1	1. Reflection and scattering of electromagnetic waves by earth surfaces 1.1 Bidirectional reflectance distribution function 1.2 Bidirectional reflectance factor 2. Spectral reflectance properties of earth surfaces and objects
Atmospheric effects on satellite observations	1	1. Absorption and scattering of electromagnetic waves by atmospheric particles 2. Atmospheric radiative transfer of electromagnetic waves 3. Atmospheric effects on satellite observations 4. Correction of atmospheric effects
Optical sensors	1	1. Principles of visible and reflective infrared sensors 2. Examples of visible and reflective infrared sensors 3. Applications of reflective infrared sensors
Thermal infrared sensors	1	1. Principles of thermal infrared sensors 2. Measurements of surface temperature by satellite sensors 3. Examples of thermal infrared sensors 4. Applications of thermal infrared sensors
Image processing 1 (Image correction)	1	1. Image processing procedure 2. Image enhancement 3. Image correction 4. Correction of geometrical distortion
Image processing 2 (Image classification)	1	1. What is image classification? 2. Theory of image classification 3. Classification rules 4. Image classification procedure
Microwave sensors	2	1. Microwave 2. Microwave sensors 3. Real Aperture Radar (RAR) 4. Synthetic Aperture Radar (SAR) 5. Interferometric SAR 6. Differential Interferometric SAR
Laser data	2	1. Statistical processing of point clouds 2. Three-dimensional modeling using terrestrial laser data 3. Three-dimensional modeling using airborne laser data
Image processing 3	1	1. Edge extraction 2. Segmentation 3. Three-dimensional modeling with laser data

【Textbook】

【Textbook(supplemental)】・ W. G. Rees 著，Physical Principles of Remote Sensing 2nd ed., Cambridge University Press

・ J. A. Richards 著，Remote Sensing Digital Image Analysis: An Introduction, Springer-Verlag

・日本リモートセンシング研究会編，図解リモートセンシング，日本測量協会

・ Fundamentals of Remote Sensing: A Tutorial by the Canada Center for Remote Sensing（http://ccrs.nrcan.gc.ca/resource/tutor/fundam/index$_e$.php）

【Prerequisite(s)】Basic knowledge in computer information processing

【Web Sites】

【Additional Information】

10A808

Civic and Landscape Design

景観デザイン論

【Code】10A808 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 3rd

【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	2	
	2	
	2	
	1	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F223

Risk Management Theory

リスクマネジメント論

【Code】10F223 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Wed 3rd

【Location】C1-173 【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	
	6	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10X333

Disaster Risk Management

災害リスク管理論

【Code】10X333 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Wed 4th 【Location】C1-171
【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】English
【Instructor】TATANO Hirokazu, YOKOMATSU Muneta
【Course Description】Natural disasters have low frequencies but high impacts. It is very important to make an integrated risk management plan that consists of various countermeasures such as prevention, mitigation, transfer, and preparedness. This class will present economic approaches to natural disaster risk management and designing appropriate countermeasures.
【Grading】Evaluate mainly by the presentations in the class as well as end-of-term report, taking active and constructive participation in the class into account.
【Course Goals】Students are expected to understand fundamental ways of economic analyses of disaster prevention such as economic valuation of disaster losses, decision making principle under risks, derivation of benefits of risk management.
【Course Topics】

Theme	Class number of times	Description
Introduction to disaster risk management	1	Introduction and Explanation of Course Outline, The Global Trends of Natural Disasters
1. Decision making theory under uncertainty	1	Bayes' theorem, Expected utility function
Methods of disaster risk management	1	Risk control and risk finance
Economic valuation of catastrophic risk mitigation	1	Cost-Benefit analysis, conventional valuation method, catastrophic risks and economic valuation of disaster mitigation
Risk perception bias, land-use and risk communication	2	Risk perception bias, land-use model, risk communication
Disaster risk finance	2	Recent issues of risk finance market, reinsurance, CAT bond, roles of government, derivatives
Risk curve and risk assessment	1	Fragility curve and risk assessment
General equilibrium analysis under disaster risk	1	General equilibrium model under disaster risk
Macrodynamics under disaster risk	1	GDP, economic growth
Disaster accounting	1	Accounting systems
Exercise and presentation	2	Students' exercise and presentation

【Textbook】Tatano,H., Takagi,A.(ed.):Economic Analysis of disaster prevention, Keiso pub.,2005 (in Japanese).
【Textbook(supplemental)】Froot ,K.A.(ed)“The Financing of Catastrophic Risk”, the University of Chicago Press
Kunreuther H. and Rose, A.,“The Economics of Natural Hazards”, Vol.1 & 2, The International Library of Critical Writings in Economics 178, Edward Elgar publishers, 2004
Okuyama, Y., and Chang, S.T.,(eds.)“Modeling Spatial and Economic Impacts of Disasters”(Advances in Spatial Science), Springer, 2004.
【Prerequisite(s)】Nothing
【Web Sites】No web site
【Additional Information】

693287

Disaster Information

防災情報特論

【Code】693287 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Wed 3rd 【Location】 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Hirokazu Tatano(DPRI), Katsuya Yamori(DPRI), Michinori Hatayama(DPRI), Shingo Suzuki(DPRI)

【Course Description】This lecture gives an outline of disaster prevention and reduction countermeasures both inside and outside Japan with special reference to disaster information related topics. Concrete examples of disaster information systems are introduced to show that psychological aspect of information users under critical social conditions is carefully taken into account in such current disaster information systems.

【Grading】Submit every class reports and end-of-term report Every class reports:

“Point out 3 discoveries for you and 1 request which you want to know more with reasons in this class.

Submit report via Email by the following rules

1. Address: disaster_info@imdr.dpri.kyoto-u.ac.jp
2. subject:“Disaster Information Report [Date] Student ID, Name”
3. Don’t use attached file.
4. Dead line: Next Tuesday

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
What is disaster prevention?	1	
Information system in emergency	2	
Information system in emergency	1	
Case examples on introduction of disaster information system	1	
Information system for evacuation planning,	1	
Information system for rescue activity	1	
Social psychological study of disaster information	2	
Disaster information and evacuation behavior	2	
Gaming approach to disaster risk communication	3	
Test	1	

【Textbook】Nothing

【Textbook(supplemental)】Only Japanese Books

【Prerequisite(s)】

【Web Sites】

【Additional Information】Office Hours: After Class, Make an appointment immediately after.

Questions via Email: disaster_info@imdr.dpri.kyoto-u.ac.jp

10A845

Theory & Practice of Environmental Design Research

環境デザイン論

【Code】10A845 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 2nd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	9	
	5	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A402

Resources Development Systems

資源開発システム工学

【Code】10A402 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 1st

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	6	
	4	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F053

Applied Mathematics in Civil & Earth Resources Engineering

応用数理解析

【Code】10F053 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 3rd

【Location】C1-117 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K008

Computational Mechanics and Simulation

計算力学及びシミュレーション

【Code】10K008 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 2nd 【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture and Exercises 【Language】English 【Instructor】Shirato, Gotoh, Murata, Liang

【Course Description】The process to obtain numerical solutions for various problems in compuational mechanics. Descretization and some solvinng technique for initial/boundary value problems is to be introdeced by the FEM, FDM, VM and PM with programming exercises. Statistical mechanics, molecular dynamics, Monte Carlo method and Multiple scale model will be shortly introduced in order to understand the basic theory of molecular dynamics simulation. Their application to engineering problems are to be also given by showing some up-to-date examples. As one of the dynamic response analysis of engineering structures, evaluation method of Wind-induced response is to be introduced with practical expmaples. Current technology of the particle method by is to be explained on the violent flow phenomena with free surface. The prticular subjects in PM such as mometum conservation and convection of pressure disturbance by numerical instability, etc. will be inntroduced. This course will be given in English.

【Grading】Achievement is evaluated by submitted reports to each topic.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Solving boundary value problem by FEM	4	
Homogenization technique and FEM	4	Homogenization method with FEM will be lectured in this item. It is used for obtaining the equivalent homogenized material constants of an anisotropic composit material to be analyzed. The method to obtain homogenized elastic coefficient tensor will be especially focused on.
Molecular dynamics simulation		
Random vibration analysis of enngineering structures in turbulent flow	2	Theories onn frequency and spectrum analysis, linear system, potential flow, unsteady airfoil, random vibration and extreme value will be digested which are the basis of the above-mentioned response analysis.
Free surface flow analysis by particle method	4	Current technology of the particle method by is to be explained on the violent flow phenomena with free surface. The prticular subjects in PM such as mometum conservation and convection of pressure disturbance by numerical instability, etc. will be inntroduced.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A405

Environmental Geosphere Engineering

地殻環境工学

【Code】10A405 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】C1-192 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F069

Modelling of Geology

数理地質学

【Code】10F069 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】C1-173 【Credits】2

【Restriction】should have unit(s) of an introductory lecture on earth science (i.e. Introduction to Earth Science) and/or earth resources engineering

【Lecture Form(s)】Leture, excercises, field excursions 【Language】Japanese or English (change every year)

【Instructor】Yasuhiro YAMADA

【Course Description】This lecture is on modelling of a geology phenomenon which becomes indispensable when carrying out underground-resources development. First of all, the lecture tells that geologic phenomena are complicated as a fundamental posture and mathematical analysis is possible only a part of them. Then, a various analysis techniques and the analysis example are explained with the basic theory for simplifying the natural phenomena to construct geologic models. Then, field excursions are carried out to see relation between topography and local geology. During the excursions, students learn the conditions and assumptions which are needed to model complicated phenomena in which two or more factors involve. The phenomenon in which modelling is possible is limited to a few part.

【Grading】Based on the reports on the lectures and field excursions.

【Course Goals】Students understand the scope of this lecture, the complexity of natural phenomena and our limited knowledge on them, and can explain the contents to others.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Theme, lecture / excursion schedule, evaluation etc
modelling theory	2	basic theory on geologic modelling
methods and examples	6	methods of geologic modelling and examples are explained with exercises.
excursion 1	4	excursion to NE Kyoto basin to see the relation between topography and geology, in term of an active fault
excursion 2	2	excursion to SW Kyoto basin to see the relation between topography and geology, in term of a relatively inactive fault

【Textbook】no textbook. appropriate articles will be provided.

【Textbook(supplemental)】appropriate books will be informed, this may include ones on geologic modelling.

【Prerequisite(s)】basic knowledge on earth science, including skills to read geologic and geography maps, required.

【Web Sites】

【Additional Information】this lecture includes field excursions. the dates will be determined during the first class, thus all applicants have to attend this class.

10F071

Applied Elasticity for Rock Mechanics

応用弾性学

【Code】10F071 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Fri 3rd

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	1	
	8	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F073

Fundamental Theories in Geophysical Exploration

物理探査の基礎数理

【Code】10F073 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Fri 3rd 【Location】C1-117

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Hitosih Mikada, Tada-nori Goto

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	3	
	3	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F087

Design of Underground Structures

地下空間設計

【Code】10F087 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Tue 3rd

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Toshihiro Asakura, Tsuyoshi Ishida

【Course Description】Outline of the characteristic of underground, the present state and trend of underground development, historical change of underground utilization are explained.
Especially, design and maintenance technology for tunnels and underground opening, and rock stress problem, are lectured in detail.

【Grading】Attendance(50%), class quiz and report(50%)

【Course Goals】Acquire the fundamental technology of underground structure design and maintenance.

【Course Topics】

Theme	Class number of times	Description
Guidance	1	Course description, Grading and Goals
Historical change	1	Historical change of underground development
Environment and Characteristic	1	Environment and Characteristic of underground
Act of deep underground use	1	Social background of the act and engineering problem
Rock stress	2	Underground stability and rock stress problems
Construction(1)	1	Survey technology for tunnelling
Construction(2)	2	Design technology for tunnelling and feed back system
Construction(3)	2	Construction work for tunnelling
Construction(4)	1	Evaluation and utilization of measurement
Maintenance	2	Maintenance technology, Tunnel deformation, Earthquake disaster of tunnels

【Textbook】No set text

【Textbook(supplemental)】Instructed in class

【Prerequisite(s)】Taking Underground Development Engineering and Rock Engineering (when undergraduate) are desirable.

【Web Sites】

【Additional Information】

10F083

Frontiers in Energy Resources

エネルギー資源開発工学

【Code】10F083 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Thu 2nd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F085

Measurement in the earth's crust environment

地殻環境計測

【Code】10F085 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Wed 3rd 【Location】C1-192
【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English
【Instructor】Tsuyoshi ISHIDA, Toshihiro ASAKURA, Koji YAMAMOTO
【Course Description】Necessity of information on the environment in the upper layer of the earth's crust will be explained, as well as measuring methods for it and applications of the measuring results for various engineering projects. Among them, rock stress measurements and their applications will be focused in the relation to the projects of oil field development, underground disposal of high level radio active waste, geological sequestration of CO2, construction of underground power houses and hot dry rock geothermal power extraction. The importance of initial stress conditions on planning and maintenance of tunnels and others also will be discussed.
【Grading】Grading will be made from scores of the followings: ・Report for classes by Ishida. ・Achievement test for classes by Yamamoto. ・Report for classes by Asakura. ・Number of attendance for the classes.
【Course Goals】Goals of this course are the followings. 1) To understand the important effect of initial rock stress on stability of underground chambers and deep underground tunnels. 2) To understand stress relief methods as one of typical methods to measure initial rock stress condition. 3) To understand the principle of a least square method though learning a procedure to determine an initial rock stress condition from released strains measured on a borehole wall. 4) To understand importance and purpose of rock stress measurement for oil field development through borehole breakout problems and others. 5) To understand hydraulic fracturing stress measurement conducted in drill holes for oil field development. 6)To understand history of tunneling technology in Japan. 7) To understand relations between maintenance of tunnels and underground environment. 8) To understand countermeasures against damages of tunnels induced by earthquakes.
【Course Topics】

Theme	Class number of times	Description
Importance of rock stress condition in underground development (by ISHIDA)	3	Necessity of rock stress measurements and their applications for various engineering projects. Among the projects, underground disposal of high level radio active waste, geological sequestration of CO2, construction of underground power houses and hot dry rock geothermal power extraction will be focused.
Stress relief methods to measure rock stress and applicaiton of least square method (by ISHIDA)	3	Actual field works of stress relief methods to measure initial rock stress condition will be explained. Though learning a procedure to determine an initial rock stress condition from released strains measured on a borehole wall, the principle of a least square method will be explained. The report subject will be shown in the last week.
Rock stress measurement for oil field development (by YAMAMOTO)	4	Estimation of rock stress condition by hydraulic fracturing and logging, which is conducted at various steps for oil field development, will be explained. Importance of rock stress affecting on borehole stability will be explained as well.
Tunneling technology in relation to underground environment (by ASAKURA)	4	Tunneling technology in Japan is historically reviewed. Relations between maintenance of tunnels and underground environment and countermeasures against damages of tunnels induced by earthquakes will be explained.

【Textbook】None. Printed materials will be given in classes when needed.
【Textbook(supplemental)】Amadei, B. & Stephansson, O.: Rock Stress and Its Measurements, Capman & Hall, 1977.
【Prerequisite(s)】Elasticity, Linear Algebra (Calculation of Matrices) and Computer Literacy (for example, Excel, Word and so on.)
【Web Sites】
【Additional Information】This class is made by English.

10F039

Time Series Analysis

時系列解析

【Code】10F039 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Tue 4th 【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	3	
	1	
	2	
	2	
	1	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F086

Energy System Management

エネルギー基盤マネジメント工学

【Code】10F086 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Fri 2nd 【Location】C1-171 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English 【Instructor】Katsuaki Koike

【Course Description】Securance and develpment harmonious with natural environments of the mineral and fossil energey resources, and utilization of storage function of geologic strata have become important issues for consructing ssustainable society. This subject introduces comprehensively the present situation of uses of mineral and energy resources, crust structure and dynamics, economic geology for the genesis and geologic envisonments of deposits, physical and chemical exploration methods of marine deposits, mathematical geology for reserve assessment, engineering geology for resource development and geological repository, and problems and promisingness of natural energy such as geothermal, solar, wind, and tide.

【Grading】Integrated evaluation by attendance to the classes and report grades

【Course Goals】To find out directionality about the technologies required for constructing sustainable society by yourself with full understandings of genetic mecanism, biased distribution, and the present situation of demand and supply of the mineral and energy resources.

【Course Topics】

Theme	Class number of times	Description
Introduction of mineral resources	1	Classification of minerals used for resources, recent trend on social demand of mineral resources, industrial uses of each mineral, and sustainability.
Introduction of Energy resources	1	Classification of energy sources, recent trend on social demand of energy, physical characteristics of each energy resources, and sustainability.
Physical and chemical properties of crust	1	Inner structure of the Earth, geodynamics, geologic composition, temperature structure, rock physics, and chemical composition of crust.
Economic geology (1)	1	Classification of ore deposits, distribution of each type of ore deposit, generation mechanism of deposit.
Economic geology (2)	1	General structure and distribution of fuel deposits (coal, petroleum, and natural gas), generation mechanism of deposits, and geological process of formation.
Resource exploration (1)	1	Physical and chemical exploration technologies for natural resources in terrestrial area. Representative methods are remote sensing, electric sounding, electromagnetic survey, and seismic prospecting.
Resource exploration (2)	1	Introduction of marine natural resources such as methane hydrate, cobalt-rich crust, and manganese nodule, and exploration technologies for the deposits in sea area.
Assessment of ore reserves and reservoir characterization	1	Fundamentals of geostatistics, variography for spatial correlation structure, spatial modeling by kriging, geostatistical simulation, integration of hard and soft data, and feasibility study
Resource development (1)	1	Development and management technologies of energy resources related to coal, petroleum, and natural gas.
Resource development (2)	1	Characteristics of natural energy related to geothermal, solar, wind, and tide, assessment of natural energy resources, and development and management technologies of resources.
Resource development (3)	1	Development of uranium deposits, mechanism and characteristics of nuclear power generation, and management technologies of nuclear power.
Engineering geology (1)	1	Groundwater, long-term stability assessment of rock mass, chemical reaction of rocks with groundwater, and hydraulic properties of rocks at multi-scales.
Engineering geology (2)	1	Fundamentals of deep geological repository for high-level nuclear waste, CCS (carbon dioxide capture and storage), and underground storage of petroleum and gas.
Sustainability	1	Co-existence of natural resource development with environment, low-carbon society, and problems for human sustainability.

【Textbook】Printed materials on the class contents are distributed before each class.

【Textbook(supplemental)】References on each topic will be instructed in classes.

【Prerequisite(s)】Elementary knowledge of engineering, mathematics, physics, and geology.

【Web Sites】

【Additional Information】

10F081

Infrastructure Creation Engineering

社会基盤工学創生

【Code】10F081 【Course Year】 【Term】1st term 【Class day & Period】Thu 4th 【Location】C1-192

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	2	
	2	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10X311

Urban Infrastructure Management

都市基盤マネジメント論

【Code】10X311 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Mon 3rd

【Location】C1-117 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】English

【Instructor】OHTSU Hiroyasu

【Course Description】This lecture aims to provide interdisciplinary knowledge associated with how urban infrastructure is comprehensively management, from viewpoint of not only economy but also "human security engineering". In detail, the contents of lectures consist of following topics:
Urban Infrastructure Asset Management,
Urban Environment Accounting System,
Urban Energy Supply Management,
Urban Food/Water Supply Management,
Urban Transport/Logistics Management.

【Grading】Participation(10), Presentation(50), Report(40)

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Guidance, Introduction of Urban Infrastructure Asset Management	2	
Urban Infrastructure Asset Management	3	
Urban Transport/Logistics Management	3	
Urban Environment Accounting System	2	
Urban Food/Water Supply Management	2	
Urban Energy Supply Management	2	
Presentation	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F112

Introduction to Sustainability/ Survivability Science

生存科学概論

【Code】10F112 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 1st 【Location】C1-192 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English 【Instructor】K. Takara (DPRI), H. Ishikawa (DPRI), B. He (DPRI), T. Hosoda (Engineering) and S. Yoden (Science)

【Course Description】There are many threats for human beings on the earth: medicine/infectious diseases, food, population, energy, water, environment and natural hazards and disasters. This class gives how to cope with these for human beings and societies. If we realized sustainable society, there are still catastrophes that we have to face. This class considers how to survive such catastrophic situations. Especially focused on are frequent and amplified extreme weather due to climatic change (or global warming) and subsequent severe disasters, water and environmental problems. Concepts and technologies for these problems are introduced, discussing the future perspectives of our society, science and technology based on various aspects and examples of climate, culture and ways of life in the world.

【Grading】Students will be evaluated by the number of attendance and a final written examination.

【Course Goals】Any graduate students in various disciplines can join this class. Mixture of different graduate students from different disciplines gives good discussions in the classroom in which global issues will be introduced and discussed by the teachers and students together. This is a graduate school level lecture class including presentations by students.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	The framework of sustainability/survivability science is given to understand its significance.
Examples	2	Introducing how to cope with various examples of threats that human beings are facing: medicine/infectious diseases, food, population, energy, water, environment and natural hazards and disasters.
Global warming and mitigation	3	A theory of global warming, technical countermeasures of mitigation and political situation in the world are given.
Extreme weather and its prediction	2	Recent water-related disasters and water problems due to extreme weather are introduced.
Adaptation	3	Examples and ideas of adaptation in the world are considered to cope with water-related disasters that are occurring more frequent and getting bigger.
Discussions	3	Giving students an opportunity to express their own ideas, teachers and students discuss his/her ideas.
Summary	1	Conclude this series of lectures.

【Textbook】No textbook specified. Handouts will be distributed if necessary.

【Textbook(supplemental)】Relevant literature would be introduced.

【Prerequisite(s)】The class is given in English with some Japanese language supplement for technical/special words. No background knowledge is necessary. Reading, writing and discussing in English is requirement.

【Web Sites】This lecture is related to a Global COE Program “Sustainability/survivability science for a resilient society adaptable to extreme weather conditions”(GCOE-ARS) for a period of 2009 to 2013. See also http://ars.gcoe.kyoto-u.ac.jp/ for further information.

【Additional Information】This class, which is given as graduate school-level lectures, can be taken by any graduate students from different disciplines including natural science, social science and humanity. Mixture of graduate students from different disciplines encourages exciting and interesting discussions by them to discuss global environmental issues with several professors and PDs.

693291

Emergency Management Systems

危機管理特論

【Code】693291 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 4th 【Location】Bldg.No.10-Informatics 1 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	4	
	3	
	3	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F201

Information Technology for Urban Society

都市社会情報論

【Code】10F201 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Thu 1st

【Location】C1-192 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Related Instructors

【Course Description】The advancement of urban society by the use of information has been realized through the remarkable development of informational communication technology. This seminar has the discussions about the worth and affect in the urban society using engineering and economic estimation method, and lectures about the way of maintenance, operation and management of urban systems in the advanced informational and knowledge-intensive society.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Details will be provided in the first lecture.

10F150

Long-Term Internship

長期インターンシップ

【Code】10F150 【Course Year】Master and Doctor Course 【Term】 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese

【Instructor】Related instructors

【Course Description】Through the long-term internship outside the university, the students can get the practical techniques, the way of finding and solving the problems, the way of integrating the techniques, the way of summarizing the results and making the presentation in each field of Urban Management.

【Grading】Writing plans, completing internship, final report and presentation are comprehensively evaluated.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10U201

Integrated Seminar on Urban Management A

都市社会工学総合セミナーA

【Code】10U201 【Course Year】Doctor 1st year 【Term】1st term 【Class day & Period】Fri 5th

【Location】C1-171 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】English

【Instructor】Related instructors

【Course Description】The students pick up the various types of influential elements on the development of urban society, and the students make the collection and analysis of datas in detail about these elements by themselves. In addition, on the basis of results of investigation and analysis, the students develop the argument about the ideal style or the future vision of urban society, and the students make the presentation and discussion in English about these results each other.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Details will be provided in the guidance and first lecture.

10U203

Integrated Seminar on Urban Management B

都市社会工学総合セミナーＢ

【Code】10U203 【Course Year】Doctor 1st year 【Term】2nd term 【Class day & Period】Tue 5th

【Location】C1-171 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】English

【Instructor】Related instructors

【Course Description】On the investigation of themes by the students, they make the presentation and discussion in English. The themes are about the urban policy on the world-wide viewpoint, the ideal style of urban management, the standardization of project technology for internationalization, the project management such as the contract, the tender, the management technology to country risk and so on, and about the problems on the structure of urban society for internationalization such as the technology movement or the role of Japan in the world on improving urban infrastructure.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Details will be provided in the guidance and first lecture.

10U216

ORT on Urban Management

都市社会工学ＯＲＴ

【Code】10U216 【Course Year】Doctor 1st 【Term】1st+2nd term

【Class day & Period】1st term: Thu 3rd&4th, 2nd term: Thu 4&5th 【Location】C1-173 【Credits】4 【Restriction】

【Lecture Form(s)】 【Language】 【Instructor】Related instructors

【Course Description】By practicing the research themes on Urban Management and making the presentations of research results at the conferences, the students can develop the advanced specialities, the ability of finding out the new fields of research. Also, the students can get the practical ability which is necessary for researchers and engineers . The students can participate in the conferences at home and abroad, the presentations of research at laboratory, some kinds of seminars and symposiums, lecture classes and internship to the enterprises or research organizations at home and abroad. The director of the department and the supervisor totally evaluate the reports made about these activities by the students.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Details will be given in the guidance.

10U212

Practice in Advanced Urban Management

都市社会工学総合実習

【Code】10U212 【Course Year】Doctor 1st 【Term】1st+2nd term

【Class day & Period】1st term: Mon 4th, 2nd term: Fri 5th 【Location】1st term:C1-171, 2nd term: C1-172

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】 【Instructor】Related instructors

【Course Description】In this seminar, the research themes are given to the students, including the advancement of infrastructure by the innovation of urban informational communication technology, the disaster risk management in the advanced communicate society, the maintenance of infrastructure for age of internationalization, and the techniques of social or energy infrastructure for the urban management. The students have to make the reports and presentations about these themes through the discussion with the supervisors.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z001

Urban Transport Policy

都市交通政策フロントランナー講座

【Code】10Z001 【Course Year】Master and Doctor Course 【Term】1st term

【Class day & Period】see the handbook for course registration

【Location】conference room, UPL karasuma office （see the handbook for course registration） 【Credits】1

【Restriction】see the handbook for course registration 【Lecture Form(s)】Intensive Lecture 【Language】Japanese

【Instructor】Dai Nakagawa, JongJin Yoon, Tetsuharu Oba, and Mitsuya Matsubara

【Course Description】This class will provide lectures on the new transport policy carried out in domestic and foreign cities and to understand the difference between the conventional transport policy and the new urban transport policy. Also, it will cover a process to realize the new urban transport policy.

【Grading】evaluation by attendance and class participation

【Course Goals】to understand the difference between the conventional transport policy and the new urban transport policy

【Course Topics】

Theme	Class number of times	Description
Outline	1	
Front runner of urban transport policy in the world	2	Reallocation of road space, Pedestrianisation
Front runner of urban transport policy in Japan	1	Downtown activation, Strategies of sustainable transport for our cities, Climate change
Front runner of urban transport policy in Kyoto	1	Eco model city, Transport demand management, Public transport network
Basic concept and best practices of new urban transport policy	1	Community bus, Compact city
Discussion and presentation	2	

【Textbook】No textbook

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.upl.kyoto-u.ac.jp/index.html

【Additional Information】

10Z002

Policy for Low-Carbon Society

低炭素都市圏政策論

【Code】10Z002 【Course Year】Master and Doctor Course 【Term】1st term

【Class day & Period】see the handbook for course registration

【Location】conference room, UPL karasuma office （see the handbook for course registration） 【Credits】1

【Restriction】see the handbook for course registration 【Lecture Form(s)】Intensive Lecture 【Language】Japanese

【Instructor】Dai Nakagawa, Eiichi Taniguchi, Masashi Kawasaki, Yasunaga Wakabayashi, Tsutomu Doi, JongJin Yoon, Mitsuya Matsubara

【Course Description】This class will provide lectures on the contents of policies and the methods to realize a low carbon society. Also, it will cover the knowledge and the technical skill to relate to urban activation, reduction of the environmental load, compact city planning, and so on.

【Grading】evaluation by attendance and class participation

【Course Goals】to understand the knowledge and the technical skill to relate to urban activation, reduction of the environmental load, compact city planning, and so on.

【Course Topics】

Theme	Class number of times	Description
Outline	1	
Direction of urban policy for low-carbon society	1	Compact city, Interaction between land-use and transport
Urban policy for low-carbon society and change of urban structure	1	Public transport, Pedestrianisation
Landscape & environmental planning	1	Landscape design in public space, View structure
Downtown activation & urban policy for low-carbon society	1	Downtown activation, Compact city
Urban policy management for low-carbon society	1	Eco model city、Guideline for low-carbon city construction
City logistics	1	Logistics、Corporate social responsibility, Intelligent transport systems、Freight quality partnership
Discussion	1	

【Textbook】No textbook

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.upl.kyoto-u.ac.jp/index.html

【Additional Information】

10Z003

Urban Transport Management

都市交通政策マネジメント

【Code】10Z003 【Course Year】Master and Doctor Course 【Term】1st term

【Class day & Period】see the handbook for course registration

【Location】conference room, UPL karasuma office （see the handbook for course registration） 【Credits】1

【Restriction】see the handbook for course registration 【Lecture Form(s)】Intensive Lecture 【Language】Japanese

【Instructor】Dai Nakagawa, Satoshi Fujii, Nobuhiro Uno, JongJin Yoon, Tetsuharu Oba, and Mitsuya Matsubara

【Course Description】This class will provide lectures on characteristics and problems of transport modes such as car, public transport, and foot. Also, it will cover the technical skill to analyze present urban traffic problems quantitatively.

【Grading】evaluation by attendance and class participation

【Course Goals】to understand characteristics and problems of transport modes such as car, public transport, and foot.

【Course Topics】

Theme	Class number of times	Description
Outline	1	
Plan and practice of public transport	1	City activation and attractiveness, Public transport, Light rail transit, Bus
Basic concept of mobility management	1	Mobility management, Activation of the public transport, Downtown activation
Investigation, interpretation, and evaluation on urban traffic phenomenon	3	Person trip survey, Transportation demand management, Cost-benefit analysis
Exercise and discussion	2	

【Textbook】No textbook

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.upl.kyoto-u.ac.jp/index.html

【Additional Information】

10Z050

Liveable City Design

安寧の都市デザイン

【Code】10Z050 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Wed 1st 【Location】【Credits】2 【Restriction】see the handbook for course registration 【Lecture Form(s)】Relay Lecture 【Language】Japanese 【Instructor】Eiichi Taniguchi

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z051

Contemporary advanced urban policy I

現代都市政策特論Ⅰ

【Code】10Z051 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration 【Location】 【Credits】2

【Restriction】see the handbook for course registration 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Eiichi Taniguchi

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	2	
	2	
	2	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z052

現代都市政策特論Ⅱ

【Code】10Z052 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	6	
	3	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z053

Contemporary Health Sciences I

現代健康科学特論Ⅰ

【Code】10Z053 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration 【Location】 【Credits】2

【Restriction】see the handbook for course registration 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z054

現代健康科学特論Ⅱ

【Code】10Z054 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z055

アメニティ都市政策論

【Code】10Z055 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 5th 【Location】 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z056

都市健康科学基礎論

【Code】10Z056 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z057

Foundation of Disaster Medicine

災害医療基礎論

【Code】10Z057 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration 【Location】 【Credits】2

【Restriction】see the handbook for course registration 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
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	1	
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	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z058

Seminar on Liveable Cities A

安寧の都市セミナーA

【Code】10Z058 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration 【Location】 【Credits】1

【Restriction】see the handbook for course registration 【Lecture Form(s)】Relay Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z059

安寧の都市セミナー B

【Code】10Z059 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】1 【Restriction】

【Lecture Form(s)】Relay Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z060

クライシスマネジメント

【Code】10Z060 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z061

KANSEI urban engineering

感性都市工学

【Code】10Z061 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration 【Location】 【Credits】2

【Restriction】see the handbook for course registration 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Z062

実践プロジェクト

【Code】10Z062 【Course Year】 【Term】1st+2nd term 【Class day & Period】 【Location】 【Credits】2

【Restriction】 【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	6	
	1	
	6	
	1	
	6	
	1	
	7	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F464

Hydrologic Design and Management

水工計画学

【Code】10F464 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 3rd 【Location】C1-173

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Michiharu SHIIBA, Yasuto TACHIKAWA and Sunmin KIM

【Course Description】Methods for hydrologic design and real-time rainfall-runoff predictions are described. The frequency analysis of hydrologic extreme values and the time series analysis of hydrologic variables are described, and then the methods to set the external force for the hydrologic design are explained. Next, a physically based hydrologic model which includes the process of human activities for the hydrologic cycle is described. In addition, the predictive uncertainty for the hydrologic simulation is introduced. A flood control planning and water resources management with the use of innovative hydrologic simulation tools is described. Then, the climate change and the relation to the hydrologic design are discussed. A real-time rainfall runoff prediction method with the use of Kalman filter theory is described.

【Grading】Examination and report

【Course Goals】The class aims to understand the statistical analysis and time serried analysis of hydrologic variables to set the external force of hydrologic designs, applications of hydrologic simulations for hydrologic designs, and real-time rainfall and runoff prediction methods for water resources management.

【Course Topics】

Theme	Class number of times	Description
Introduction	0.5	The aim of the class is introduced. The flood control planning and water resources planning are introduced.
Frequency analysis and hydrologic design	1.5	The frequency analysis of hydrologic extreme values is described. The methods to set the external force for the hydrologic design are explained.
Time series analysis and hydrologic design	3	The time series analysis of hydrologic variables is described. The methods to develop time series models, time serried data generation methods, spatiotemporal variation of hydrologic variables and a random field model, disaggregation methods are explained.
Hydrologic modeling and modeling system	1	A physically based hydrologic model which includes the process of human activities for the hydrologic cycle is described. A hydrologic modeling system which helps to develop complicated hydrologic simulation models is also described.
Hydrologic predictive uncertainty	1	Hydrologic predictive uncertainty is explained, which is inevitable and comes from model structure uncertainty, parameter identification uncertainty and model input uncertainty. Especially, the relation between spatiotemporal scales of hydrologic modeling and model parameter values is described, and then the linkage between the relation and the hydrologic predictive uncertainties is discussed.
Flood prediction and hydrologic design	1	A physically-based distributed hydrologic model which incorporates dam reservoir operation is introduced. Evaluation of the effect of flood control facilities and more effective dam reservoir operation are discussed.
Climate change and hydrologic design	2	Data analysis of the latest GCM simulation is presented and the possible changes of hydrologic extremes and hydrologic design are discussed.
Real-time rainfall runoff prediction	4	A real-time rainfall runoff prediction method with the use of Kalman filter theory is described.

【Textbook】Non. Handouts are distributed at each class.

【Textbook(supplemental)】

【Prerequisite(s)】Basic knowledge of hydrology, probability and statistics

【Web Sites】http://hywr.kuciv.kyoto-u.ac.jp/lecture/lecture.html

【Additional Information】

10F245

Open Channel Hydraulics

開水路の水理学

【Code】10F245 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 1st 【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English 【Instructor】HOSODA, Takashi

【Course Description】Fundamental theory of Open Channel Hydraulics used in River Engineering and Urban Fluid Engineering Fields are lectured, showing various applications in Hydraulic Engineering Field. The contents include the following items: Application of singular point theory to water surface profile analysis, Derivation of 2-D depth averaged model, 1-D analysis of unsteady open channel flows, Plane 2-D analysis of steady high velocity flows, Plance 2-D analysis of unsteady flows, Higher order theory, etc.

【Grading】Regular examination

【Course Goals】to understand the grounds of Open Channel Hydraulics and to learn how to apply Open Channel Hydraulics to practical problems in hydraulic engineering field.

【Course Topics】

Theme	Class number of times	Description
Guidance	1	The outline of this class is introduced by overviewing the whole framework of Open Channel Hydraulics with various computational results.
Derivation of 2-D depth averaged model	1	Derivation procesures of plane 2-D depth averaged model are expalined in detail
Application of singular point theory to water surface profile analysis	1	
1-D analysis of unsteady open channel flows	3	Fundamental characteristics of 1-D unsteady open channel flows, Method of Characteristics, Dam break flow, Computational methods
Plane 2-D analysis of steady high velocity flows	1	Characteristics of steady plane 2-D flow are explained based on the method of characteristics.
Plance 2-D analysis of unsteady flows	3	Propagation of characteristic furface, shear layer instability, application of a generalized curvilinear coordinate to river flow computation, application of a moving coordinate system, etc.
Higher order theory	3	Boussinesq equation with the effect of vertical acceleration, full/partially full pressurized flow onserved in sewer network, trafic flow analysis by means of dynamic wave model

【Textbook】Printed materials on the contents of this class are distributed in class.

【Textbook(supplemental)】

【Prerequisite(s)】Elementary knowledge of fluid dyanamics and hydraulics

【Web Sites】

【Additional Information】Students can contact with Hosoda by sending e-mail to hosoda.takashi.4w@kyoto-u.ac.jp This class is not open in 2011.

10F269

Coastal and Urban Water Disasters Engineering

沿岸・都市防災工学

【Code】10F269 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】C1-192 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	3	
	1	
	1	
	1	
	1	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F466

Basin Environmental Disaster Mitigation

流域環境防災学

【Code】10F466 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 3rd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	3	
	3	
	3	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F023

Numerical Methods in Geomechanics

地盤数値解析法

【Code】10F023 【Course Year】 【Term】1st term 【Class day & Period】Thu 1st 【Location】C1-117

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	3	
	6	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F222

Advanced Transport Logistics

先進交通ロジスティクス工学

【Code】10F222 【Course Year】 【Term】 【Class day & Period】 【Location】 【Credits】 【Restriction】

【Lecture Form(s)】Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A420

Lecture on Exploration Geophysics

探査工学特論

【Code】10A420 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Wed 4th

【Location】C1-117 【Credits】2

【Restriction】The class of "Fundamental theories of geophysical exploration" is recommended to acuire.

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Hitosih Mikada, Tada-nori Goto

【Course Description】Applied geophysical exploration technologies in disaster mitigation, civil engineering, and earth resources engineering is discussed in terms of seismological and of electromagnetic theories. Students may be asked to process data or design digital filters in the course.

【Grading】Attendances to the class and reports are weighted as 60 and 40, respectively.

【Course Goals】Understanding seismiclogical and electromagnetic theories used in geophysical exploration and subsurface-imaging technologies.

【Course Topics】

Theme	Class number of times	Description
Electromagnetic signal processing	3	Principles of magnetotelluric methods, electromagnetic sources and noise reduction.
Modeling technologies in electromagnetic methods	3	Subsurface structure modeling in EM methods. The effects of surface weathered layers, the identification of spatial dimensions, and modeling methodologies are discussed.
Signal processing in seismics	3~4	Digital filtering in seismic data processing.
Reflection seismology	3	Fundamental theories of reflection seismic data processing. Seismic migration is the one to be briefly discussed.
Petrophysics	1~2	Fundamental petrophysics, and fundamental measurement theories in geophysical logging are discussed.

【Textbook】Specified in the course.

【Textbook(supplemental)】J.F.Claerbout, 1976, Fundamentals of Geophysical Data Processing, (OOP:photocopies to be specified)

【Prerequisite(s)】The credits of "Exploration Geophysics" in undergraduate course and "Fundamental Theories of Geophysical Exploration" in graduate course are requested to obtain before the classes.

【Web Sites】May be specified by the lecturers.

【Additional Information】

10Z004

Policy for Low-Carbon Society, Advanced.

低炭素都市圏政策特論

【Code】10Z004 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration

【Location】2nd floor conference room, UPL karasuma office 【Credits】1

【Restriction】see the handbook for course registration 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Kiyoshi Kobayashi

【Course Description】This class will provide lectures on integrated policy packages of pricing, energy policy, urban land use as well as the contents of transport policy to realize a low carbon society. Also, it will cover current trends of various policies and technologies for a low carbon society.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】No textbook

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.upl.kyoto-u.ac.jp/index.html

【Additional Information】

10Z005

Urban Transport Management, Advanced.

都市交通政策マネジメント特論

【Code】10Z005 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration

【Location】2nd floor conference room, UPL karasuma office 【Credits】1

【Restriction】see the handbook for course registration 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Dai Nakagawa, Ryoji Matsunaka, Satoshi Fujii, JongJin Yoon, Tetsuharu Oba, and Mitsuya Matsubara

【Course Description】This class will provide lectures on advanced technical skill to analyze present urban traffic problems quantitatively and evaluation methods of the policy. Also, it will cover the contents of transportation funding and consensus building, and so on.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】No textbook

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.upl.kyoto-u.ac.jp/index.html

【Additional Information】

10Z006

Capstone Project Practice

キャップストーンプロジェクト演習

【Code】10Z006 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】see the handbook for course registration

【Location】2nd floor conference room, UPL karasuma office 【Credits】1

【Restriction】see the handbook for course registration 【Lecture Form(s)】Seminar 【Language】Japanese

【Instructor】Dai Nakagawa, Ryoji Matsunaka, JongJin Yoon, Tetsuharu Oba, and Mitsuya Matsubara

【Course Description】A capstone is a finishing stone placed on the apex of a pyramid. This class will enable students to apply and integrate what they learn, and give them an opportunity to explore in greater depth, one or more of the topics covered in the courses.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	1	
	3	
	1	

【Textbook】No textbook

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.upl.kyoto-u.ac.jp/index.html

【Additional Information】

10F439

Environmental Risk Analysis

環境リスク学

【Code】10F439 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 4th

【Location】C1-192 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	2	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A632

Urban Metabolism Engineering

都市代謝工学

【Code】10A632 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Tue 3rd

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】,

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	5	
	4	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F454

Systems Approach on Sound Material Cycles Society

循環型社会システム論

【Code】10F454 【Course Year】 【Term】1st term 【Class day & Period】Mon 3rd 【Location】C1-192

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Shinichi Sakai, Yasuhiro Hirai

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	4	
	2	
	4	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F441

Water Quality Engineering

水環境工学

【Code】10F441 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 2nd

【Location】C1-171 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Hiroshi TSUNO, Hiroaki TANAKA, Fumitake NISHIMURA

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	4	
	5	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F234

Water Sanitary Engineering

水質衛生工学

【Code】10F234 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 2nd

【Location】C1-192【Credits】2【Restriction】No Restriction【Lecture Form(s)】Lecture【Language】【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	5	
	5	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F461

Nuclear Environmental Engineering, Adv.

原子力環境工学

【Code】10F461 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Thu 2nd

【Location】C1-192 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture

【Language】Japanese 【Instructor】, , ,

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F446

Atmospheric and Global Environmental Engineering, Adv.

大気・地球環境工学特論

【Code】10F446 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Wed 2nd

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Yuzuru MATSUOKA, Gakuji KURATA

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F400

Seminar on Urban and Environmental Engineering A

都市環境工学セミナーA

【Code】10F400 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F402

Seminar on Urban and Environmental Engineering B

都市環境工学セミナーB

【Code】10F402 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A643

Environmental Microbiology, Adv.

環境微生物学特論

【Code】10A643 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 1st

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Hiroshi TSUNO, Hiroaki TANAKA, Fumitake NISHIMURA, Naoyuki YAMASHITA

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	2	
	2	
	1	
	2	
	1	
	1	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A626

Advanced Environmental Health

環境衛生学特論

【Code】10A626 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 3rd

【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese

【Instructor】,

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	2	
	9	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10W424

Environmental-friendly Technology for Sound Material Cycle

環境資源循環技術

【Code】10W424 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Fri 3rd

【Location】C1-192 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】H.Tssuno,K.Miura,F.Nishimura,M.Takaoka,H.Nakagawa

【Course Description】Global warming, ecosystem crisis, and depletion of natural resources are of great concern today. To solve these problems, we have to build the sustainable society where low carbon dioxide emission, low environmental burdens, and the reduction of wastes by recycling are realized. It is possible to utilize municipal wastes, wastewaters, and unused biomass as resources instead of the natural resources used at present. Recycling-oriented technologies that enable sustainable utilization of those wastes and the concept to develop those technologies are introduced.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	5-6	
	4-5	
	4-5	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A622

Geohydro Environment Engineering. Adv.

地圏環境工学特論

【Code】10A622 【Course Year】Master Course 【Term】1st term 【Class day & Period】Thu 1st

【Location】C1-173 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10X321

Lecture on Environmental Management Leader

環境リスク管理リーダー論

【Code】10X321【Course Year】Master and Doctor Course【Term】1st term【Class day & Period】Thu 5th【Location】C1-171【Credits】2【Restriction】
【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】TANAKA Hiroaki, SHIMIZU Yoshihisa, FUJII Shigeo
【Course Description】In this class, we ’ ll give lectures on theory of risk analysis, risk identification, risk assessment, risk evaluation, and risk reduction and avoidance in the field of urban human security including human health risk and ecological risk. The main purpose of this lecture is to provide students basic viewpoint and knowledge required for environmental leaders who can practically solve environmental issues occurring in developing countries, showing several international environmental projects as practical case works.
【Grading】Participation, Oral and Poster Presentation, and Report
【Course Goals】The main purpose of this lecture is to provide students with the basic viewpoint and knowledge required for environmental leaders able to practically solve environmental issues occurring in developing countries, focusing on several international environmental projects as practical case works.
【Course Topics】

Theme	Class number of times	Description
Introduction	1	In this introductory lecture, the current situation and problems of the environment in Asian developing countries are explained, and basic ideas for their improvement measures are given together with fundamental terminologies.
Energy and Environment	1	
View point and commitment to rural environmental issues	1	
Disaster Risk Management and Grass-roots International Cooperation	1	
Environmental Risk Assessment and Risk Communication	1	
Water, Sanitation and Solid Waste Management for Developing Countries	1	
Presentations and Discussions	1	
Japan's Lessens on Economy & Development	1	
Solid Waste Management	1	
Ensuring Sustainability in Water Supply and Sewerage Sector	1	
Water Supply and Human Security	1	
Impending Issues in Lake Biwa-Yodo River Water Management and the Basin Governance	1	
Environment & Sanitary Engineering Research International Session	1	
Poster Presentation in Environment & Sanitary Engineering Research Symposium	1	

【Textbook】
【Textbook(supplemental)】
【Prerequisite(s)】
【Web Sites】
【Additional Information】To be announced at class about poster presentation in Environment & Sanitary Engineering Research Symposium.

10F456

New Environmental Engineering I, Advanced

新環境工学特論 I

【Code】10F456 【Course Year】 【Term】1st term 【Class day & Period】Mon 5th

【Location】Reserch Bldg.No.5-Lecture Room(2nd floor)/C1-171 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F458

New Environmental Engineering II, Advanced

新環境工学特論 II

【Code】10F458 【Course Year】 【Term】2nd term 【Class day & Period】Mon 5th 【Location】Reserch Bldg.No.5-Lecture Room(2nd floor)/C1-171

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Prof. Matsuoka, Prof. Shimidzu, Associate Prof. Takaoka, Associate Prof. Kurata, Prof. Fujii

【Course Description】This course provides various kinds of engineering issues related to atmospheric environment and solid wastes management in English, which cover fundamental knowledge, the latest technologies and regional application examples. These lectures, English presentations by students, and discussions enhance English capability and internationality of students. The course is conducted in simultaneous distance-learning from Kyoto University, or from remote lecture stations in University of Malaya, and Tsinghua University. For the distance-learning, a hybrid system is used, which consists of prerecorded lecture VIDEO, VCS (Video conference system) and SS (slide sharing system). The students are requested to give a short presentation in English in the end of the lecture course. This course may improve students ’ English skill and international senses through these lectures, presentations, and discussions.

【Grading】Evaluate by class attendance, Q&A and presentation.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Global warming and Low carbon society	1	Global warming and Low carbon society (Matsuoka)
Science of Air Pollution: Health Impacts	1	Science of Air Pollution: Health Impacts (Prof. Nik, University of Malaya)
Atmospheric diffusion and modeling	1	Atmospheric diffusion and modeling (Prof. S Wang, Tsinghua University)
Air Pollution, Its Historical Perspective from Asian Countries (I),China	1	Air Pollution, Its Historical Perspective from Asian Countries (I),China (Prof. Hao, Tsinghua University)
Air Pollution, Its Historical Perspective from Asian Countries (II), Malaysia	1	Air Pollution, Its Historical Perspective from Asian Countries (II), Malaysia (Prof. Nik, University of Malaya)
Air Pollution, Its Historical Perspective from Asian Countries (III), Japan	1	Air Pollution, Its Historical Perspective from Asian Countries (III), Japan (Kurata)
Student Presentations /Discussions I	1	Student Presentations /Discussions I (all)
Solid Waste Management	1	Solid Waste Management (Takaoka）
Introduction to Municipal Solid Waste (MSW) Management	1	Introduction to Municipal Solid Waste (MSW) Management(Prof. Agamuthu, University of Malaya)
Solid Waste Management, Case Study in China	1	Solid Waste Management, Case Study in China (Prof. Wang, Tsinghua University)
Solid Waste Management, Case Study in Japan	1	Solid Waste Management, Case Study in Japan (Takaoka）
Solid Waste Management, Case Study in Malaysia	1	Solid Waste Management, Case Study in Malaysia (Prof. Agamuthu, University of Malaya)
Student Presentations /Discussions II	1	Student Presentations /Discussions II (all)

【Textbook】Class handouts

【Textbook(supplemental)】Introduce in the lecture classes

【Prerequisite(s)】

【Web Sites】

【Additional Information】Either of this course or “New Environmental Engineering I, advanced” can be dealt as “Asian Environmental Enigneering”. PowerPoint slides are main teaching materials in the lectures, and their hard copies are distributed to the students. In addition, a list of technical terms and difficult English words is given to the students with their explanation and Japanese translation.

10F468

Environmental Organic Micropollutants Analysis Lab.

環境微量分析演習

【Code】10F468 【Course Year】Master and Doctor Course 【Term】Intensive course (27th-29th Sep.)

【Class day & Period】9:00 am- 6:00 pm

【Location】Seminer Room, Research Center for Environmental Quality Management 【Credits】2

【Restriction】around 10 students 【Lecture Form(s)】Intensive Lecture 【Language】Japanese

【Instructor】Shimizu, Yoshihisa, Matsuda, Tomonari

【Course Description】This 3 days intensive course, limited to around 10 people, will be held in Research Center for Environmental Quality Management in Otsu City. This course includes both lecture and experiments about analytical strategies of environmental micropollutants.

【Grading】Reports and attendance

【Course Goals】Understand about principle and practical techniques of chromatography. Understand about principle of several bioassays.

【Course Topics】

Theme	Class number of times	Description
HPLC -How to separate it-	3	Learn about principle and practice of HPLC separation. How do you choose columns, solvents and detectors? How to improve peak separation?
Fractionation and Purification by using HPLC	3	Learn about practical techniques of fractionation and purification using HPLC.
LC/MS/MS	5	Learn about principle and practice of LC/MS/MS analysis. Understand about 3 different scan modes, full scan, daughter scan and MRM. How to make an analytical method in a refined way for substances of your interest.
Bioassays	4	Lecture about several bioassays which are used for evaluation of environmental toxicity, and discuss about how to identify toxic compounds in environment by using HPLC in combination with bioassays.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】This intensive course is useful especially for students who usually use or intend to use HPLC and LC/MS/MS for their research.

10F470

Advanced Enivironmental Engineering Lab.

環境工学先端実験演習

【Code】10F470 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】 【Location】C1-173

【Credits】2 【Restriction】 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	4	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F472

Seminer on Practical Issues in Urban and Environmental Enginering

環境工学実践セミナー

【Code】10F472 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】Fri 4th

【Location】C1-192 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F449

Exercises in Urban and Environmental Engineering A

都市環境工学演習A

【Code】10F449 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】Fri 5th 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F450

Exercises in Urban and Environmental Engineering B

都市環境工学演習Ｂ

【Code】10F450 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D051

Frontiers in Modern Science & Technology

現代科学技術の巨人セミナー「知のひらめき」

【Code】10D051 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 5th

【Location】Katsura Hall 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D040

Exercise in Practical Scientific English

実践的科学英語演習「留学ノススメ」

【Code】10D040 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】Seminar 【Language】English 【Instructor】Kenji Wada. etc

【Course Description】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Grading】Attendance 60%, midterm reports 20%, final report 20%. The final report must be submitted by the deadline date.

【Course Goals】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Course Guidance, etc.
Exercise-1	1	Definition of technical writing 3C in technical writing Weaknesses of Japanese writers Good examples and bad examples
Exercise-2	1	Punctuation Presentation skills 1 -organization
Exercise-3	1	Organizing your thoughts for the title and abstract Presentation skills 2 ?Visual aspects
Exercise-4	1	Presenting the background of your research Presentation skills 3 ?Oral Aspects
Exercise-5	1	Describing how you did your research Presentation skills 4 ?Physical Aspects
Exercise-6	1	Presenting what you observed Presentation Practice
Exercise-7	1	Placing your findings in the field Presentation Practice
Exercise-8	1	Expressing thanks and listing references Presentation practice
Exercise-9	1	Writing your proposal Presentation practice
Exercise-10	1	Presentation practice Reviews & Feedbacks Evaluation
Wrap-up lecture	1~2	Current situation of studying abraod, etc.

【Textbook】No textbook is required.

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.ehcc.kyoto-u.ac.jp/alc/ (needs passwords).

【Additional Information】For details, contact Dr. Wada (wadaken@scl.kyoto-u.ac.jp).

10U401

Advanced Seminar on Urban and Environmental Engineering A

都市環境工学特別セミナーA

【Code】10U401 【Course Year】Doctor Course 【Term】1st+2nd term

【Class day & Period】First: Thu 3rd and 4th, Second: Wed 1st and 2nd 【Location】C1-226 【Credits】4

【Restriction】 【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10U403

Advanced Seminar on Urban and Environmental Engineering B

都市環境工学特別セミナーＢ

【Code】10U403 【Course Year】Doctor Course 【Term】1st+2nd term

【Class day & Period】First: Fri 3rd and 4th, Second Thu 3rd and 4th 【Location】C1-226 【Credits】4 【Restriction】

【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F475

ORT on Urban and Environmental Engineering

都市環境工学 ORT

【Code】10F475 【Course Year】Doctor Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10W603

医工学基礎

【Code】10W603 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V020

Internship DL

インターンシップ DL（機械工学群）

【Code】10V020 【Course Year】Doctor Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】6 【Restriction】 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V019

Internship DS

インターンシップ DS（機械工学群）

【Code】10V019 【Course Year】Doctor Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G049

Internship M

インターンシップ M（機械工学群）

【Code】10G049 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V012

Advanced Exercise in Mechanical Engineering and ScienceA

機械理工学特別演習 A

【Code】10V012 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V013

Advanced Exercise in Mechanical Engineering and ScienceB

機械理工学特別演習Ｂ

【Code】10V013 【Course Year】【Term】2nd term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V014

Advanced Exercise in Mechanical Engineering and ScienceC

機械理工学特別演習Ｃ

【Code】10V014 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V015

Advanced Exercise in Mechanical Engineering and ScienceD

機械理工学特別演習 D

【Code】10V015 【Course Year】【Term】2nd term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V016

Advanced Exercise in Mechanical Engineering and ScienceE

機械理工学特別演習 E

【Code】10V016 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V017

Advanced Exercise in Mechanical Engineering and ScienceF

機械理工学特別演習 F

【Code】10V017 【Course Year】【Term】2nd term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G051

Experiments on Mechanical Engineering and Science,Adv. I

機械理工学特別実験及び演習第一

【Code】10G051 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G057

Engineering Ethics and Management of Technology

技術者倫理と技術経営

【Code】10G057 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Thu 3rd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	9	
	5	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G055

Crystallography of Metals

金属結晶学

【Code】10G055 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Fri 4th

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Q807

Theory for Design Systems Engineering

デザインシステム学

【Code】10Q807 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Tue 3rd

【Location】Room 213, Butsurikei-Building 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】Tetsuo Sawaragi and Hiroaki Nakanishi

【Course Description】The lecture focuses on the human design activity; designing artifacts (things, events and systems) based on human intuitions, and designing human-machine systems in which the relations between human and objects are of importance.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	3	
	3	
	3	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V003

Biomechanics

バイオメカニクス

【Code】10V003 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 3rd

【Location】Engineering Science Depts Bldg.-830 【Credits】2 【Restriction】 【Lecture Form(s)】

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693513

ヒューマン・マシンシステム論

【Code】693513 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 3rd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G045

複雑系機械工学

【Code】10G045 【Course Year】【Term】2nd term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V029

Seminar of Complex Mechanical Engineering,C

複雑系機械工学セミナー C

【Code】10V029 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10G025

Mechanical Functional Device Engineering

メカ機能デバイス工学

【Code】10G025 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Wed 3rd

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	4	
	2	
	2	
	2	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G041

Advanced Finite Element Methods

有限要素法特論

【Code】10G041 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	4	
	3	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B407

Robotics

ロボティクス

【Code】10B407 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 2nd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	4	
	1	
	3	
	4	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G001

Applied Numerical Methods

応用数値計算法

【Code】10G001 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 1st

【Location】Engineering Science Depts Bldg.-313 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	
	2	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B440

Environmental Fluid Dynamics

環境流体力学

【Code】10B440 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Wed 2nd

【Location】Engineering Science Depts Bldg.-213 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	4	
	6	
	5	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G007

Introduction to Advanced Fluid Dynamics

基盤流体力学

【Code】10G007 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Tue 3rd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	5	
	5	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693510

機械システム制御論

【Code】693510 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 2nd

【Location】Engineering Science Depts Bldg.-315 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G031

Seminar on Mechanical Engineering and Science A

機械理工学セミナーA

【Code】10G031 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】2 【Restriction】

【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	-	
	-	
	-	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G032

Seminar on Mechanical Engineering and Science B

機械理工学セミナーB

【Code】10G032 【Course Year】 【Term】2nd term 【Class day & Period】 【Location】 【Credits】

【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	-	
	-	
	-	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G053

Experiments on Mechanical Engineering and Science,Adv. II

機械理工学特別実験及び演習第二

【Code】10G053 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693518

共生システム論

【Code】693518 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 4th 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Q610

Seminar: Dynamics of Atomic Systems

原子系の動力学セミナー

【Code】10Q610 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 5th

【Location】Room 216 + Educational PC Room #1 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture + Exercise 【Language】Japanese

【Instructor】M. Matsumoto, R. Matsumoto, T. Shimada

【Course Description】Particle simulations are the tool of analyzing microscopic phenomena, and widely used in various fields of engineering. After providing the basics of particle simulation methods through lectures and exercises, we show various practical applications in thermofluids, solid materials, and quantum systems.

【Grading】Reports

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Basics of MD simulations	4-5	- Numerical simulation of equations of motion - Model potentials - Data analysis - Equilibrium vs. non-equilibrium
Application: Thermofluidal systems	2-3	- Lennard-Jones fluids - Interface, phase change, energy transport, etc.
Application: Solid systems	2-3	- Deformation and destruction - Other methods
Application: Quantum systems	2-3	- First principle MD - Mechanical and electronic properties on nanoscale

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Elementary Level of
Analytical mechanics, Quantum mechanics, Material science, Statistical physics, Numerical analysis

【Web Sites】

【Additional Information】

10G003

Solid Mechanics, Adv.

固体力学特論

【Code】10G003 【Course Year】Master Course 【Term】1st term 【Class day & Period】Thu 2nd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	3	
	3	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G021

Engineering Optics and Spectroscopy

光物理工学

【Code】10G021 【Course Year】 【Term】2nd term 【Class day & Period】Wed 1st

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	4-5	
	2	
	6	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B631

High Energy Radiation Effects in Solid

高エネルギー材料工学

【Code】10B631 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 4th

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Q607

Materials Strength at Elevated Temperatures

高温強度論

【Code】10Q607 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Fri 1st

【Location】Engineering Science Depts Bldg.-213 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1－2	
	2－3	
	2－3	
	1－2	
	1－2	
	0－1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G403

Optimum System Design Engineering

最適システム設計論

【Code】10G403 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 2nd

【Location】Engineering Science Depts Bldg.-101 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	3	
	5	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G023

Vibration and Noise Control

振動騒音制御

【Code】10G023 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Mon 1st

【Location】Engineering Science Depts Bldg.-213 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Hiroshi MATSUHISA, Hideo UTSUNO

【Course Description】Vibration and noise control of machines and structures are explained. Passive, active and semi-active vibration controls explained.

【Grading】Examination

【Course Goals】Understand the basic theories of vibration and sound control and be able to apply them to the actual problem.

【Course Topics】

Theme	Class number of times	Description
Passive vibration control	2	
Semi-active vibration control	2	
Active vibration control	2	
Modal Analysis	1	
Theory of sound	3	
Propagation of sound in outdoor field	2	
Indoor sound	1	
Technology of noise reduction	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K004

New Engineering Materials, Adv.

新工業素材特論

【Code】10K004 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 5th

【Location】(Katsura)A1-131 (Yoshida)Lecture Room3,Reseach Bldg.No.4 【Credits】2 【Restriction】

【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	Composite Materials: Smart, Lightweight and Strong Materials (HOJO)
	1	Innovations in High Performance Steels for Bridge Construction (SUGIURA)
	1	Materials in Micro Electro Mechanical Systems (MEMS) (TSUCHIYA)
	1	High Temperature Superconductivity and Its Application to Electronics(SUZUKI)
	1	Sustainability Issues(SHIMIZU)
	1	Material Properties of Fiber Reinforced Cementitious Composites and Applicability to Structures (KANEKO)
	1	Structural biochemistry of proteins (SHIRAKAWA)
	2	Semiconductor Materials and Devices (KIMOTO)
	1	Separation Analysis in Micro- and Nano-scale (OTSUKA)
	1	Polymer Synthesis beyond the 21st Century:Precision Polymerizations and Novel Polymeric Materials (SAWAMOTO)
	1	Inorganic New Materials (EGUCHI)

【Textbook】

【Textbook(supplemental)】Class handouts

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G011

Design and Manufacturing Engineering

設計生産論

【Code】10G011 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 2nd

【Location】Engineering Science Depts Bldg.-315 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B418

Strength of Advanced Materials

先進材料強度論

【Code】10B418 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 2nd

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	3	
	3	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K013

Advanced Mechanical Engineering

先端機械システム学通論

【Code】10K013 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】Tue 5th and Thu 4th 【Location】Engineering Science Depts Bldg.-213 or a teacher's office

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	2	
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B634

Advanced Experimental Techniques and Analysis in Engineering Physics

先端物理工学実験法

【Code】10B634 【Course Year】Master and Doctor Course 【Term】(intensively; in summer vacation)

【Class day & Period】 【Location】Research Reactor Institute 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V007

Neutron Science Seminor 1

中性子材料工学セミナーⅠ

【Code】10V007 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】

【Location】Research Reactor Institute 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V008

Neutron Science Seminar II

中性子材料工学セミナーII

【Code】10V008 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B628

Physics of Neutron Scattering

中性子物理工学

【Code】10B628 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 4th

【Location】Engineering Science Depts Bldg.-312 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	13	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B828

High Precision Engineering

超精密工学

【Code】10B828 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Tue 2nd 【Location】Engineering Science Depts Bldg.-216 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese+Englihs 【Instructor】Ari Ide-Ektessabi

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Introduction to High Precision Analysis Using Synchrotron Radiations
High precision Measurement	2	Synchrotron Radiation and X-ray Fluorescence Spectroscopy
High precision Measurement	3	Micro Imaging and Quantitative XRF micro Analysis
High precision Measurement	4	Fine Structure Spectroscopy
High precision Measurement	5	Fine Structure Spectroscopy
High precision Measurement	6	Synchrotron Radiation Measurement
Applications in bio-nano technology	7	Elemental Images of Single Neurons by Using SR-XRF I
Applications in bio-nano technology	8	Elemental Images of Single Neurons by Using SR-XRF II
Applications in bio-nano technology	9	Elemental Imaging of Mouse ES Cells(Application)
Applications in bio-nano technology	10	Application of Synchrotron Radiation in the Investigation of process of neuronal differentiation
Applications in bio-nano technology	11	Chemical State Imaging for Investigations of Neurodegenerative Disorders (Parkinsonism-Dementia Complex)
Applications in bio-nano technology	12	Chemical State Imaging for Investigations of Neurodegenerative Disorders: Chemical State of Iron in Parkinsonism Dementia Complex (PDC)
Applications in bio-nano technology	13	Comparison with other techniques
Applications in bio-nano technology	14	Comparison with other techniques

【Textbook】

【Textbook(supplemental)】Application of Synchrotron Radiation, Arid Ide-Ektessabi, Sp ringer 2007

【Prerequisite(s)】

【Web Sites】http://ocw.kyoto-u.ac.jp/graduate-school-of-engineering-jp/ultra-high-precision-analysis/schedule

【Additional Information】

10G013

Dynamic Systems Control Theory

動的システム制御論

【Code】10G013 【Course Year】 【Term】1st term 【Class day & Period】Tue 2nd

【Location】Engineering Science Depts Bldg.-315 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	5	
	5	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G029

Patent Seminar

特許セミナー

【Code】10G029 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Fri 2nd

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	3	
	2	
	2	
	5	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

653316

熱機関学

【Code】653316 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 3rd 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	7	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G039

Transport Phenomena

熱物質移動論

【Code】10G039 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Fri 3rd

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】Nakabe, Kazuyoshi, Tatsumi, Kazuya

【Course Description】The important learning objective of this class is to understand the fundamental mechanisms of momentum, heat, and mass transfer phenomena, the knowledge of which will be markedly required for the thermal energy control technologies to further practice conservations of natural resources and energies for sustainable development. Heat and mass transfer processes consisting of conduction and forced/natural convection will be highlighted in detail, referring to the similarity characteristics of flow velocity, fluid temperature, and species concentration. Some topics on Reynolds stress, turbulent heat flux, and phase change will be introduced, expanding to their numerical models, together with some recent trends of high-tech heat and energy devices.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Surrounding Examples of Transport Phenomena	1	
Governing Equations and Non-Dimensional Parameters	3 ～ 4	
Boundary layer flows	2 ～ 3	
External and Internal Flows	1 ～ 2	
Turbulent Phenomena	2 ～ 3	
Topics of Flow and Heat Transfer Mechanism	2 ～ 3	
	1	

【Textbook】

【Textbook(supplemental)】Example Transport Phenomena (Bird, R.B. et al.)

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B622

Thermophysics for Thermal Engineering

熱物性論

【Code】10B622 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 1st

【Location】Engineering Science Depts Bldg.-314 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2-3	
	2	
	2	
	2-3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G005

Thermal Science and Engineering

熱物理工学

【Code】10G005 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 3rd

【Location】Engineering Science Depts Bldg.-315 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】H. Yoshida & M. Matsumoto

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
(M) Brownian motion	1	
(M) Transport phenomena and correlation functions	1	
(M) Spectral analysis and fractal analysis	2	
(M) Stochastic process and its application	2-3	
(Y) Entropy and free energy: revisit	1	
(Y) Science of atmosphere and ocean	3	
(Y) Hydrogen energy	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Thermodynamics, Statistical physics, Heat transfer engineering, Numerical analysis etc.

【Web Sites】

【Additional Information】

653322

燃焼理工学

【Code】653322 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 1st 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G017

Fracture Mechanics

破壊力学

【Code】10G017 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 1st

【Location】Engineering Science Depts Bldg.-312 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Toru Ikeda

【Course Description】The basics of the fracture mechanics will be lectured.
Elastic problem, Airy's stress function, Stress function with complex number, Stress function of a crack, Stress field around a crack tip, Stress intensity factors, Energy release rate, J-integral, Cohesive model, Engineering applications of the fracture mechanics, Fatigue crack extension, Elastic plastic fracture mechanics, Interfacial fracture mechanics etc.

【Grading】Mini-reports at every lectures and the final report will be evaluated.

【Course Goals】The objective of this lecture is to master the basic knowledge of the fracture mechanics, and to be able to discuss about the fracture mechanics at the conferences for the fracture mechanics.

【Course Topics】

Theme	Class number of times	Description

【Textbook】The teacher provide articles for this lecture.

【Textbook(supplemental)】T. L. Anderson, Fracture Mechanics (Fundamentals and Applications) Second Edition, CRC Press Inc., ISBN 0-8493-4260-0, 1995

【Prerequisite(s)】The traditional material strength and the linear elastic mechanics should be learned before taking this lecture.

【Web Sites】

【Additional Information】

10V025

Seminar of Complex Mechanical Engineering,A

複雑系機械工学セミナーA

【Code】10V025 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10V027

Seminar of Complex Mechanical Engineering,B

複雑系機械工学セミナー B

【Code】10V027 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Thu 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10V031

Seminar of Complex Mechanical Engineering,D

複雑系機械工学セミナー D

【Code】10V031 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Thu 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10V033

Seminar of Complex Mechanical Engineering,E

複雑系機械工学セミナー E

【Code】10V033 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10V035

Seminar of Complex Mechanical Engineering,F

複雑系機械工学セミナー F

【Code】10V035 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Thu 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10G019

Molecular Fluid Dynamics

分子流体力学

【Code】10G019 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Tue 1st 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	5	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V010

Seminar on Molecular Gas Dynamics

分子流体力学セミナー

【Code】10V010 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Wed 3rd

【Location】Bldg.No.11-Aeronautics 3 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G009

Quantum Condensed Matter Physics

量子物性物理学

【Code】10G009 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Thu 1st

【Location】Engineering Science Depts Bldg.-313 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	2	
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693431

力学系理論特論

【Code】693431 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 1st 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G036

機械理工学基礎セミナーA

【Code】10G036 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】2 【Restriction】

【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G037

機械理工学基礎セミナーB

【Code】10G037 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Q402

Turbulence Dynamics

乱流力学

【Code】10Q402 【Course Year】 【Term】2nd term 【Class day & Period】Tue 3rd

【Location】Engineering Science Depts Bldg.-213 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Hanazaki

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	4	
	2	
	2	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D450

Biomolecular Dynamics

生体分子動力学

【Code】10D450 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 3rd

【Location】Engineering Science Depts Bldg.-213 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V003

Biomechanics

バイオメカニクス

【Code】10V003 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 3rd

【Location】Engineering Science Depts Bldg.-830 【Credits】2 【Restriction】 【Lecture Form(s)】

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10W603

医工学基礎

【Code】10W603 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V020

Internship DL

インターンシップ DL（機械工学群）

【Code】10V020 【Course Year】Doctor Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】6 【Restriction】 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V019

Internship DS

インターンシップ DS（機械工学群）

【Code】10V019 【Course Year】Doctor Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G049

Internship M

インターンシップ M（機械工学群）

【Code】10G049 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G057

Engineering Ethics and Management of Technology

技術者倫理と技術経営

【Code】10G057 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Thu 3rd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	9	
	5	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G045

複雑系機械工学

【Code】10G045 【Course Year】【Term】2nd term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V029

Seminar of Complex Mechanical Engineering,C

複雑系機械工学セミナー C

【Code】10V029 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10G216

Seminar on Micro Engineering A

マイクロエンジニアリングセミナーA

【Code】10G216 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】2 【Restriction】

【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	-	
	-	
	-	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G217

Seminar on Micro Engineering B

マイクロエンジニアリングセミナーＢ

【Code】10G217 【Course Year】【Term】2nd term 【Class day & Period】【Location】【Credits】2 【Restriction】

【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	-	
	-	
	-	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V210

Advanced Exercise in Micro Engineering A

マイクロエンジニアリング特別演習A

【Code】10V210 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V211

Advanced Exercise in Micro Engineering B

マイクロエンジニアリング特別演習Ｂ

【Code】10V211 【Course Year】【Term】2nd term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V212

Advanced Exercise in Micro Engineering C

マイクロエンジニアリング特別演習Ｃ

【Code】10V212 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V213

Advanced Exercise in Micro Engineering D

マイクロエンジニアリング特別演習Ｄ

【Code】10V213 【Course Year】【Term】2nd term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V214

Advanced Exercise in Micro Engineering E

マイクロエンジニアリング特別演習 E

【Code】10V214 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V215

Advanced Exercise in Micro Engineering F

マイクロエンジニアリング特別演習 F

【Code】10V215 【Course Year】【Term】2nd term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G228

Experiments on Micro Engineering, Adv. II

マイクロエンジニアリング特別実験及び演習第二

【Code】10G228 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G226

Experiments on Micro Engineering, Adv. I

マイクロエンジニアリング特別実験及び演習第一

【Code】10G226 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G205

Microsystem Engineering

マイクロシステム工学

【Code】10G205 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 3rd

【Location】Engineering Science Depts Bldg.-216 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture

【Language】English 【Instructor】O. Tabata, H. Kotera, I. Kannno, T. Tsuchiya

【Course Description】Microsystem covers not only technologies related to individual physical or chemical phenomenon in micro scale, but also complex phenomena which are eveolved from their interaction. In this course, the physics and chemistry in micro and nanoscale will be lectured in contrast to those in macro scale. The various kinds of application devices (ex. physical (pressure, flow, force) sensors, chemical sensors, biosensors, actuators (piezoelectric, electrostatic, and shape memory) and their system are discussed.

【Grading】The evaluation will be based on the reports given in each lecture.

【Course Goals】Understand the theory of sensing and actuating in microsystem. Acquire basic knowledge to handle various kinds of phenomena in microscale.

【Course Topics】

Theme	Class number of times	Description
MEMS modeling	2	Multi-physics modeling in microscale. Electro-mechanical coupling analysis.
MEMS simulation	2	System level simulation in MEMS.
Electrostatic microsystem	2	Electrostatic sensors and actuators. Theory and application devices.
Piezoelectric microsystem	2	Piezoelectric sensors and actuators. Theory and application devices.
Physical sensors	3	Physical sensors as a fundamental application in microsystem. Accelerometer, vibrating gyroscope, pressure sensors.
Micro total analysys system	2	Chemical analysis system and bio-sensing device using microsytem.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】The student of this class is strongly recommended to take a course 10V201 "Introduction to the Design and Implementation of Micro-Systems", which is a practice for designing microsystem. Those who wants to take this course, please contact one of the instructors as early as possible.

10G203

Micro Process and Material Engineering

マイクロプロセス・材料工学

【Code】10G203 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 4th

【Location】Engineering Science Depts Bldg.-216 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】H. Kotera, O. Tabata, K. Eriguchi, I. Kanno, T. Tsuchiya

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Semiconductor microfabrication	3	
Thin-film process and evaluation	3	
Silicon micromachining	3	
3D lithography	2	
Soft-micromachining	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G041

Advanced Finite Element Methods

有限要素法特論

【Code】10G041 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	4	
	3	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G001

Applied Numerical Methods

応用数値計算法

【Code】10G001 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 1st

【Location】Engineering Science Depts Bldg.-313 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	
	2	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G007

Introduction to Advanced Fluid Dynamics

基盤流体力学

【Code】10G007 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Tue 3rd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	5	
	5	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G003

Solid Mechanics, Adv.

固体力学特論

【Code】10G003 【Course Year】Master Course 【Term】1st term 【Class day & Period】Thu 2nd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	3	
	3	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K004

New Engineering Materials, Adv.

新工業素材特論

【Code】10K004 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 5th

【Location】(Katsura)A1-131 (Yoshida)Lecture Room3,Reseach Bldg.No.4 【Credits】2 【Restriction】

【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	Composite Materials: Smart, Lightweight and Strong Materials (HOJO)
	1	Innovations in High Performance Steels for Bridge Construction (SUGIURA)
	1	Materials in Micro Electro Mechanical Systems (MEMS) (TSUCHIYA)
	1	High Temperature Superconductivity and Its Application to Electronics(SUZUKI)
	1	Sustainability Issues(SHIMIZU)
	1	Material Properties of Fiber Reinforced Cementitious Composites and Applicability to Structures (KANEKO)
	1	Structural biochemistry of proteins (SHIRAKAWA)
	2	Semiconductor Materials and Devices (KIMOTO)
	1	Separation Analysis in Micro- and Nano-scale (OTSUKA)
	1	Polymer Synthesis beyond the 21st Century:Precision Polymerizations and Novel Polymeric Materials (SAWAMOTO)
	1	Inorganic New Materials (EGUCHI)

【Textbook】

【Textbook(supplemental)】Class handouts

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V203

Simulation Engineering of Living Body

生体シミュレーション工学

【Code】10V203 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Wed 2nd

【Location】Engineering Science Depts Bldg.-215 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G214

precision measurement and machining

精密計測加工学

【Code】10G214 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Tue 2nd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	3	
	2	
	1	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G011

Design and Manufacturing Engineering

設計生産論

【Code】10G011 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 2nd

【Location】Engineering Science Depts Bldg.-315 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B418

Strength of Advanced Materials

先進材料強度論

【Code】10B418 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 2nd

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	3	
	3	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K013

Advanced Mechanical Engineering

先端機械システム学通論

【Code】10K013 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】Tue 5th and Thu 4th 【Location】Engineering Science Depts Bldg.-213 or a teacher's office

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	2	
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G013

Dynamic Systems Control Theory

動的システム制御論

【Code】10G013 【Course Year】 【Term】1st term 【Class day & Period】Tue 2nd

【Location】Engineering Science Depts Bldg.-315 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	5	
	5	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G230

Dynamics of Solids and Structures

動的固体力学

【Code】10G230 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Wed 3rd 【Location】Engineering Science Depts Bldg.-213 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Shiro BIWA

【Course Description】Fundamental principles for dynamic deformations of solids and structures are examined. In particular, basic characteristics of elastic wave motion in solid media are emphasized, together with the influence of anisotropy, viscocity and nonlinearity. Technological applications of elastic waves such as ultrasonic nondestructive evaluation are also introduced.

【Grading】Grading will be based on the attendance, homework reports and the final examination (possibly replaced by reports).

【Course Goals】This course aims to establish the understanding of basic characteristics of dynamic deformations and elastic waves in solid media, as well as to learn about technological applications of ultrasound in a variety of fields extending from micro- to macro-scales. Particular emphasis is put on the mathematical aspects of the physical phenomena involved.

【Course Topics】

Theme	Class number of times	Description
Basics of wave propagation	2	One-dimensional wave equation; D'Alembert's solution; Harmonic waves; Spectral analysis; Waves in structural members; Dispersion; Phase and group velocities.
Fundamentals of elastodynamics	3	Expressions of stress and strain; Conservation laws; Hooke's law; Hamilton's principle, Love's theory for longitudinal waves in a bar.
Waves in isotropic elastic media	1	Voigt notation of Hooke's law; Navier's equations; Longitudinal and transverse waves; Propagation of plane wave.
Waves in anisotropic elastic media	1	Stiffness matrix; Propagation of plane wave; Christoffel's equation; Propagation and polarization directions.
Reflection and transmission	2	Reflection and transmission of normal incident waves; Snell's law; Mode conversion; Reflection and refraction of oblique incident waves.
Guided elastic waves	2	Bulk waves and guided waves; Rayleigh wave; Love wave; Lamb wave.
Elastic waves in real media	2	Effect of viscocity; Effect of nonlinearity; Effect of inhomogeneity; Scattering; Composite materials.
Application of elastic waves	1	Generation and detection of ultrasound; Application to materials evaluation; Application to various monitoring techniques.

【Textbook】No textbooks are assigned. The lecture is mainly given in a blackboard style. Print-outs are handed in when needed.

【Textbook(supplemental)】

【Prerequisite(s)】Basic knowledge of mechanics of materials (solid mechanics, continuum mechanics) is expected.

【Web Sites】

【Additional Information】The time units and weights for each item on the above list are subject to possible changes.

10G005

Thermal Science and Engineering

熱物理工学

【Code】10G005 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 3rd

【Location】Engineering Science Depts Bldg.-315 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】H. Yoshida & M. Matsumoto

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
(M) Brownian motion	1	
(M) Transport phenomena and correlation functions	1	
(M) Spectral analysis and fractal analysis	2	
(M) Stochastic process and its application	2-3	
(Y) Entropy and free energy: revisit	1	
(Y) Science of atmosphere and ocean	3	
(Y) Hydrogen energy	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Thermodynamics, Statistical physics, Heat transfer engineering, Numerical analysis etc.

【Web Sites】

【Additional Information】

10V201

Introduction to the Design and Implementation of Micro-Systems

微小電気機械システム創製学

【Code】10V201 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】Engineering Science Depts Bldg.-216 【Credits】2

【Restriction】Take class 10G205 "Microsystem Engineering" 【Lecture Form(s)】Lecture and Pactice

【Language】English 【Instructor】O. Tabata, H. Kotera, T. Tsuchiya, I. Kanno

【Course Description】This is a joint lecture with Hong Kong University of Science and Technology (HKUST). A team consists of two students from each University work together to fullfill the assignment (design a microsystem) through paper survey, analysis,design, and presentation. A student can acquire not only the basic knowledge of a microsystem, but also comprehensive ability of English such as technical knowledge in English, skill for team work, and communication.

【Grading】Presentation, Assignments, and Achievement

【Course Goals】Acquire the knowledge and skill to design and analyze a microsystem.

【Course Topics】

Theme	Class number of times	Description
Tutorial on microsystem CAD software	1	Master CAD program for microsystem design and analysis which will be utilized to accomplish an assignment.
Lecture and Task Introduction	1	Learn basic knowledge necessary to design a microsystem/MEMS(Micro Electromechical Systems) utilizing microfabrication technology.
Design and analysis work	3	Analyze and design a microsystem by communicating with a team member of HKUST.
Presentation I	1	The designed device and its analyzed results is presented in detail by team in English.
Evatuation of device	1	Evaluate the fabricated microsystem.
Presentation II	1	The measured results and comparison between the analyzed results of the fabricated microsystem is presented by team in English.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】The student of this class is required to take the course 10G205 "Microsystem Engineering", which provide the knowledge about the theory of sensing and actuating in microsystem. Those who wants to take this course have to take training course for CAD in advance. For more detail, please contact one of the instructors as early as possible.

10V025

Seminar of Complex Mechanical Engineering,A

複雑系機械工学セミナーA

【Code】10V025 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10V027

Seminar of Complex Mechanical Engineering,B

複雑系機械工学セミナー B

【Code】10V027 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Thu 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10V031

Seminar of Complex Mechanical Engineering,D

複雑系機械工学セミナー D

【Code】10V031 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Thu 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10V033

Seminar of Complex Mechanical Engineering,E

複雑系機械工学セミナー E

【Code】10V033 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10V035

Seminar of Complex Mechanical Engineering,F

複雑系機械工学セミナー F

【Code】10V035 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Thu 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10G211

Solid State Physics 1

物性物理学 1

【Code】10G211 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Wed 1st

【Location】Engineering Science Depts Bldg.-214 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1-2	
	1	
	1	
	1 -2	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1-2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V205

Solid State Physics 2

物性物理学 2

【Code】10V205 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Thu 2nd 【Location】Engineering Science Depts Bldg.-310 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	5	
	5	
	5	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10Q408

Quantum Theory of Chemical Physics

量子化学物理学特論

【Code】10Q408 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Wed 2nd

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	4	
	4	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B619

Quantum Theory of Condensed Matter

量子物性学

【Code】10B619 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	3	
	3	
	6	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G009

Quantum Condensed Matter Physics

量子物性物理学

【Code】10G009 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Thu 1st

【Location】Engineering Science Depts Bldg.-313 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	2	
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B617

Quantum Theory of Molecular Physics

量子分子物理学特論

【Code】10B617 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 2nd

【Location】Engineering Science Depts Bldg.-213 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	5	
	5	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G223

マイクロエンジニアリング基礎セミナーA

【Code】10G223 【Course Year】Master Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G224

マイクロエンジニアリング基礎セミナーB

【Code】10G224 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D450

Biomolecular Dynamics

生体分子動力学

【Code】10D450 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 3rd

【Location】Engineering Science Depts Bldg.-213 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G209

Multi physics Numerical Analysis

マルチフィジクス数値解析力学

【Code】10G209 【Course Year】Master 2nd 【Term】2nd term 【Class day & Period】Wed 1st

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	5	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V020

Internship DL

インターンシップ DL（機械工学群）

【Code】10V020 【Course Year】Doctor Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】6 【Restriction】 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V019

Internship DS

インターンシップ DS（機械工学群）

【Code】10V019 【Course Year】Doctor Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G057

Engineering Ethics and Management of Technology

技術者倫理と技術経営

【Code】10G057 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Thu 3rd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	9	
	5	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G420

Experiments and Exercises in Aeronautics and Astronautics II

航空宇宙工学特別実験及び演習第二

【Code】10G420 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】Experiment and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G418

Experiments and Exercises in Aeronautics and Astronautics I

航空宇宙工学特別実験及び演習第一

【Code】10G418 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】Experiment and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G401

Jet Engine Engineering

ジェットエンジン工学

【Code】10G401 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 1st

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	4	
	3-4	
	3-4	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R419

Seminar on Systems and Control

システム制御工学セミナー

【Code】10R419 【Course Year】 【Term】1st term 【Class day & Period】Tue 4th

【Location】Bldg.No.11-Aeronautics 3 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	12	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G045

複雑系機械工学

【Code】10G045 【Course Year】【Term】2nd term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V029

Seminar of Complex Mechanical Engineering,C

複雑系機械工学セミナー C

【Code】10V029 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10G041

Advanced Finite Element Methods

有限要素法特論

【Code】10G041 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	4	
	3	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G001

Applied Numerical Methods

応用数値計算法

【Code】10G001 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 1st

【Location】Engineering Science Depts Bldg.-313 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	
	2	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G007

Introduction to Advanced Fluid Dynamics

基盤流体力学

【Code】10G007 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Tue 3rd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	5	
	5	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10M226

Meteorology I

気象学Ⅰ

【Code】10M226 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 2nd 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2～4	
	2～4	
	2～4	
	2～4	
	2～4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10M227

Meteorology II

気象学II

【Code】10M227 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 2nd 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3～4	
	3～4	
	3～4	
	3～4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G003

Solid Mechanics, Adv.

固体力学特論

【Code】10G003 【Course Year】Master Course 【Term】1st term 【Class day & Period】Thu 2nd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	3	
	3	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G409

Aerospace Systems and Control

航空宇宙システム制御工学

【Code】10G409 【Course Year】 【Term】2nd term 【Class day & Period】Fri 2nd

【Location】Bldg.No.11-Aeronautics 1 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	3	
	3	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R410

Seminar on Aerospace systems

航空宇宙機システムセミナー

【Code】10R410 【Course Year】【Term】2nd term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	12	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C430

Advanced Flight Dynamics of Aerospace Vehicle

航空宇宙機力学特論

【Code】10C430 【Course Year】 【Term】1st term 【Class day & Period】Mon 4th

【Location】Bldg.No.11-Aeronautics 3【Credits】2【Restriction】【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	6	
	4	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G411

Fluid Dynamics for Aeronautics and Astronautics

航空宇宙流体力学

【Code】10G411 【Course Year】 【Term】1st term 【Class day & Period】Tue 1st

【Location】Bldg.No.11-Aeronautics 3 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	3	
	3	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V405

Seminar on Fluid Dynamics for Aeronautics and Astronutics

航空宇宙流体力学セミナー

【Code】10V405 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Wed 5th

【Location】Bldg.No.11-Aeronautics 3 【Credits】2 【Restriction】 【Lecture Form(s)】Seminar

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V407

Seminar on Optimum System Design Engineering

最適システム設計工学セミナー

【Code】10V407 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G405

Propulsion Engineering, Adv.

推進工学特論

【Code】10G405 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 3rd

【Location】Bldg.No.11-Aeronautics 3 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	2	
	3	
	2	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693410

数理解析特論

【Code】693410 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Wed 3rd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G011

Design and Manufacturing Engineering

設計生産論

【Code】10G011 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 2nd

【Location】Engineering Science Depts Bldg.-315 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K013

Advanced Mechanical Engineering

先端機械システム学通論

【Code】10K013 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】Tue 5th and Thu 4th 【Location】Engineering Science Depts Bldg.-213 or a teacher's office

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	2	
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V401

Seminar on Engineering Science of Ionized Gases

電離気体工学セミナー

【Code】10V401 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Mon 3rd

【Location】Bldg.No.11-Aeronautics 3 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	13	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G013

Dynamic Systems Control Theory

動的システム制御論

【Code】10G013 【Course Year】 【Term】1st term 【Class day & Period】Tue 2nd

【Location】Engineering Science Depts Bldg.-315 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	5	
	5	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G230

Dynamics of Solids and Structures

動的固体力学

【Code】10G230 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Wed 3rd 【Location】Engineering Science Depts Bldg.-213 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Shiro BIWA

【Course Description】Fundamental principles for dynamic deformations of solids and structures are examined. In particular, basic characteristics of elastic wave motion in solid media are emphasized, together with the influence of anisotropy, viscocity and nonlinearity. Technological applications of elastic waves such as ultrasonic nondestructive evaluation are also introduced.

【Grading】Grading will be based on the attendance, homework reports and the final examination (possibly replaced by reports).

【Course Goals】This course aims to establish the understanding of basic characteristics of dynamic deformations and elastic waves in solid media, as well as to learn about technological applications of ultrasound in a variety of fields extending from micro- to macro-scales. Particular emphasis is put on the mathematical aspects of the physical phenomena involved.

【Course Topics】

Theme	Class number of times	Description
Basics of wave propagation	2	One-dimensional wave equation; D'Alembert's solution; Harmonic waves; Spectral analysis; Waves in structural members; Dispersion; Phase and group velocities.
Fundamentals of elastodynamics	3	Expressions of stress and strain; Conservation laws; Hooke's law; Hamilton's principle, Love's theory for longitudinal waves in a bar.
Waves in isotropic elastic media	1	Voigt notation of Hooke's law; Navier's equations; Longitudinal and transverse waves; Propagation of plane wave.
Waves in anisotropic elastic media	1	Stiffness matrix; Propagation of plane wave; Christoffel's equation; Propagation and polarization directions.
Reflection and transmission	2	Reflection and transmission of normal incident waves; Snell's law; Mode conversion; Reflection and refraction of oblique incident waves.
Guided elastic waves	2	Bulk waves and guided waves; Rayleigh wave; Love wave; Lamb wave.
Elastic waves in real media	2	Effect of viscocity; Effect of nonlinearity; Effect of inhomogeneity; Scattering; Composite materials.
Application of elastic waves	1	Generation and detection of ultrasound; Application to materials evaluation; Application to various monitoring techniques.

【Textbook】No textbooks are assigned. The lecture is mainly given in a blackboard style. Print-outs are handed in when needed.

【Textbook(supplemental)】

【Prerequisite(s)】Basic knowledge of mechanics of materials (solid mechanics, continuum mechanics) is expected.

【Web Sites】

【Additional Information】The time units and weights for each item on the above list are subject to possible changes.

10V409

Thermal Engineering Seminar

熱工学セミナー

【Code】10V409 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G005

Thermal Science and Engineering

熱物理工学

【Code】10G005 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 3rd

【Location】Engineering Science Depts Bldg.-315 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】H. Yoshida & M. Matsumoto

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
(M) Brownian motion	1	
(M) Transport phenomena and correlation functions	1	
(M) Spectral analysis and fractal analysis	2	
(M) Stochastic process and its application	2-3	
(Y) Entropy and free energy: revisit	1	
(Y) Science of atmosphere and ocean	3	
(Y) Hydrogen energy	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Thermodynamics, Statistical physics, Heat transfer engineering, Numerical analysis etc.

【Web Sites】

【Additional Information】

693320

非線形力学特論 A

【Code】693320 【Course Year】 【Term】 【Class day & Period】 【Location】 【Credits】 【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V025

Seminar of Complex Mechanical Engineering,A

複雑系機械工学セミナーA

【Code】10V025 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10V027

Seminar of Complex Mechanical Engineering,B

複雑系機械工学セミナー B

【Code】10V027 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Thu 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10V031

Seminar of Complex Mechanical Engineering,D

複雑系機械工学セミナー D

【Code】10V031 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Thu 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10V033

Seminar of Complex Mechanical Engineering,E

複雑系機械工学セミナー E

【Code】10V033 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10V035

Seminar of Complex Mechanical Engineering,F

複雑系機械工学セミナー F

【Code】10V035 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Thu 1st

【Location】Engineering Science Depts Bldg.-215 【Credits】 【Restriction】 【Lecture Form(s)】Seminar

【Language】English 【Instructor】Matsuno, Ide, Matsumoto, Takata, Suzuki, Ikeda

【Course Description】This seminar provides doctor-course students an opportunity of face-to-face group discussions to exchange ideas and information with those from other research fields. It is also emphasized in this seminar to give the attendees a chance to boost up the presentation skills necessary to broaden their own expertise across multi-disciplinary research fields. The primal aim is to offer these significant experiences of leadership as a young scientist with broad perspective in the global community.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Self introduction	1-2	
Organizing groups	1	
Group activity	10-12	Each group chooses an activity theme, and pursue the goal through discussion in the group. Weekly reports on the activity are required.
Final presentation	1-2	Each group gives presentation of its final resutls.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】All activities should be done in English.

10G408

Hydrodynamic Stability Theory

流れの安定性理論

【Code】10G408 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Wed 2nd

【Location】Bldg.No.11-Aeronautics 3 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	5	
	5	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V411

流体数理学セミナー

【Code】10V411 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10G009

Quantum Condensed Matter Physics

量子物性物理学

【Code】10G009 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Thu 1st

【Location】Engineering Science Depts Bldg.-313 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	2	
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693431

力学系理論特論

【Code】693431 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 1st 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V010

Seminar on Molecular Gas Dynamics

分子流体力学セミナー

【Code】10V010 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Wed 3rd

【Location】Bldg.No.11-Aeronautics 3 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693321

非線形力学特論Ｂ

【Code】693321 【Course Year】【Term】2nd term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R017

Engineering Internship D

インターンシップD（原子核）

【Code】10R017 【Course Year】Doctor Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Exercise 【Language】

【Instructor】Hidetsugu Tsuchida

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C050

Internship M

インターンシップM（原子核）

【Code】10C050 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Exercise 【Language】Japanese

【Instructor】Hidetsugu Tsuchida

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C082

Applied Neutron Engineering

応用中性子工学

【Code】10C082 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 3rd

【Location】Bldg.No.1-Nuclear Engineering 2 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C034

Nuclear Energy Conversion and Reactor Engineering

核エネルギー変換工学

【Code】10C034 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 2nd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C013

Nuclear Materials

核材料工学

【Code】10C013 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 1st

【Location】Bldg.No.1-Nuclear Engineering 2 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	5	
	5	
	5	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C014

Nuclear Fuel Cycle 1

核燃料サイクル工学１

【Code】10C014 【Course Year】 【Term】1st term 【Class day & Period】Thu 1st

【Location】Bldg.No.1-Nuclear Engineering Sminar Room 1 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1-2	
	3-4	
	3-4	
	2-3	
	1-2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C015

Nuclear Fuel Cycle 2

核燃料サイクル工学２

【Code】10C015 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Thu 3rd

【Location】Bldg.No.1-Nuclear Engineering Sminar Room 1 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Hajimu Yamana, Toshiyuki Fujii, Akihiro Uehara

【Course Description】The reliable nuclear fuel cycle is essential to realize the long-range utilization of the nuclear energy. The scope of this course is to understand concepts, engineering schemes, and chemical principles of the nuclear fuel cycle, that is, recycling system for fast breeder reactor, nuclear reprocessing, partitioning and transmutation, especially, chemical separation, isotope enrichment, recycling methods of plutonium and thorium, environmental problems, and so on.

【Grading】Reports for subjects asked in the course.

【Course Goals】To gain the fundamental knowledge of the nuclear fuel cycle and deepen understanding of the nuclear science.

【Course Topics】

Theme	Class number of times	Description
General	1-2	Nuclear energy use and nuclear fuel cycle
Radiochemistry	3	*Formation of radionuclides in nuclear fuel *Radiochemical properties of nuclides focused in nuclear fuel cycle *Chemistry of actinide elements (f-elements)
Reprocessing	1-2	Methods and characteristics of nuclear fuel reprocessing
Concepts of reprocessing	1	Recycling of plutionium in light water reactor system (pluthermal), Thorium fuel cycle
Solution chemistry 1	2	Wet reprocessing of nuclear fuel (dissolution and extraction processes)
Solution chemistry 2	2	Pyro-reprocessing (chemistry of molten salts)
Isotope separation	1	Isotope enrichment of uranium
Environmental impact	1	Environmental impact via nuclear fuel cycle

【Textbook】Not specified. According to need, documents may be distributed.

【Textbook(supplemental)】

【Prerequisite(s)】Additional information (PDF) are available at,
http://hlweb.rri.kyoto-u.ac.jp/npc-lab/outline/index.html

【Web Sites】

【Additional Information】It is recommended to attend the course, Nuclear fuel cycle 1, before this course. Need: calculator

10C038

Physics of Fusion Plasma

核融合プラズマ工学

【Code】10C038 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Fri 4th

【Location】Bldg.No.1-Nuclear Engineering 2 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	2	
	2	
	1	
	2	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C076

Fundamentals of Magnetohydrodynamics

基礎電磁流体力学

【Code】10C076 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Thu 2nd

【Location】Bldg.No.1-Nuclear Engineering 2 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】English Lecture 【Language】English 【Instructor】Tomoaki Kunugi, Atsushi Fukuyama

【Course Description】This course provides fundamentals of magnetohydrodynamics which describes the dynamics of electrically conducting fluids, such as plasmas and liquid metals. The course covers the fundamental equations in magnetohydrodynamics, dynamics and heat transfer of magnetofluid in a magnetic field, equilibrium and stability of magnetized plasmas, as well as illustrative examples.

【Grading】Attendance and two reports

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Liquid Metal MHD	7	
Plasma MHD	8	

【Textbook】Handout of the presentation will be provided at the lecture

【Textbook(supplemental)】

【Prerequisite(s)】Fundamentals of fluid mechanics and electromagnetism

【Web Sites】

【Additional Information】

10C072

Introduction to Advanced Nuclear Engineering

基礎量子エネルギー工学

【Code】10C072 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 2nd

【Location】Bldg.No.1-Nuclear Engineering 1 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C070

Introduction to Quantum Science

基礎量子科学

【Code】10C070 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 2nd

【Location】Bldg.No.1-Nuclear Engineering 2 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	9	
	2	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C084

Nuclear Engineering, Adv.

原子核工学最前線

【Code】10C084 【Course Year】Master Course 【Term】1st term 【Class day & Period】Thu 3rd

【Location】Bldg.No.1-Nuclear Engineering 2 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C086

Introduction to Nucelar Engineering 1

原子核工学序論 1

【Code】10C086 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 2nd

【Location】Bldg.No.1-Nuclear Engineering 1 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	7	
	7	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C087

Introduction to Nucelar Engineering 2

原子核工学序論２

【Code】10C087 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】Bldg.No.1-Nuclear Engineering 1 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	7	
	6	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C068

Nuclear Engineering Application Experiments

原子力工学応用実験

【Code】10C068 【Course Year】Master and Doctor Course 【Term】1st+2nd term 【Class day & Period】

【Location】Research Reactor Institute 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Exercise

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C080

Nuclear Reactor Safety Engineering

原子炉安全工学

【Code】10C080 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 2nd

【Location】Bldg.No.1-Nuclear Engineering 2 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】Ken NAKAJIMA

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	3	
	4	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D051

Frontiers in Modern Science & Technology

現代科学技術の巨人セミナー「知のひらめき」

【Code】10D051 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 5th

【Location】Katsura Hall 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C037

Multiphase Flow Engineering and Its Application

混相流工学

【Code】10C037 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Wed 2nd
【Location】Bldg.No.1-Nuclear Engineering 2 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture
【Language】Japanese 【Instructor】KUNUGI, Tomoaki, YOKOMINE, Takehiko

【Course Description】Reviewing of the fundamental definition and characteristics of multiphase flows, and to learn the governmental equations and some modelings of the constitutive equations and the current status of the multiphase flows. Moreover, to review and learn the fundamental definition and characteristics of particle flows, and to learn the numerical methods to track the particle laden flows and the particle measurement method.

【Grading】Present a summary of some papers regarding multiphase flows research by using a power point, and then answer several questions made by lecturers. The quality of your presentation and how deep understand your subject are the grading point.

【Course Goals】As for the multiphase flows, to learn its fluid dynamics behaviors, governing equations and numerical methods, and finally to discuss its applications to many engineering fields.

【Course Topics】

Theme	Class number of times	Description
What's the multiphase flows?	1	To review the definitions and fundamental characteristics of multiphase flows.
Governing equation of gas-liquid two phase flows	2	To learn the governing equation of gas-liquid two phase flows
Modeling of gas-liquid two phase flows	2	To learn modeling of gas-liquid two phase flows and its constitutive equations
Numerical methods	3	To learn the numerical methods to solve the single-phase and two-phase flows
Examples of gas-liquid two phase flow analysis	1	To show some examples of gas-liquid two phase flow analysis
Characteristics of particle flows	1	Review characteristics of particle flows
Fundamental aspect of particle flows	1	Explain variables and parameters subjected to interaction between particle and particle and/or particle and flow. Moreover, momentum and heat exchange between phases, i.e., to explain One-way, Two-way and Four-way coupling numerical methods.
Particle methods	2	Explain numerical method for thermofluid including static particles like a packed bed. Moreover, numerical methods for macroscopic and microscopic particles such as Discrete Element Method.
Measurements of particle characteristics	2	Review several measuring methods of particle characteristics and thermofluid behaviors

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D040

Exercise in Practical Scientific English

実践的科学英語演習「留学ノススメ」

【Code】10D040 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】Seminar 【Language】English 【Instructor】Kenji Wada. etc

【Course Description】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Grading】Attendance 60%, midterm reports 20%, final report 20%. The final report must be submitted by the deadline date.

【Course Goals】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Course Guidance, etc.
Exercise-1	1	Definition of technical writing 3C in technical writing Weaknesses of Japanese writers Good examples and bad examples
Exercise-2	1	Punctuation Presentation skills 1 -organization
Exercise-3	1	Organizing your thoughts for the title and abstract Presentation skills 2 ?Visual aspects
Exercise-4	1	Presenting the background of your research Presentation skills 3 ?Oral Aspects
Exercise-5	1	Describing how you did your research Presentation skills 4 ?Physical Aspects
Exercise-6	1	Presenting what you observed Presentation Practice
Exercise-7	1	Placing your findings in the field Presentation Practice
Exercise-8	1	Expressing thanks and listing references Presentation practice
Exercise-9	1	Writing your proposal Presentation practice
Exercise-10	1	Presentation practice Reviews & Feedbacks Evaluation
Wrap-up lecture	1~2	Current situation of studying abraod, etc.

【Textbook】No textbook is required.

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.ehcc.kyoto-u.ac.jp/alc/ (needs passwords).

【Additional Information】For details, contact Dr. Wada (wadaken@scl.kyoto-u.ac.jp).

10K004

New Engineering Materials, Adv.

新工業素材特論

【Code】10K004 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 5th

【Location】(Katsura)A1-131 (Yoshida)Lecture Room3,Reseach Bldg.No.4 【Credits】2 【Restriction】

【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	Composite Materials: Smart, Lightweight and Strong Materials (HOJO)
	1	Innovations in High Performance Steels for Bridge Construction (SUGIURA)
	1	Materials in Micro Electro Mechanical Systems (MEMS) (TSUCHIYA)
	1	High Temperature Superconductivity and Its Application to Electronics(SUZUKI)
	1	Sustainability Issues(SHIMIZU)
	1	Material Properties of Fiber Reinforced Cementitious Composites and Applicability to Structures (KANEKO)
	1	Structural biochemistry of proteins (SHIRAKAWA)
	2	Semiconductor Materials and Devices (KIMOTO)
	1	Separation Analysis in Micro- and Nano-scale (OTSUKA)
	1	Polymer Synthesis beyond the 21st Century:Precision Polymerizations and Novel Polymeric Materials (SAWAMOTO)
	1	Inorganic New Materials (EGUCHI)

【Textbook】

【Textbook(supplemental)】Class handouts

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C004

Quantum Field Theory

場の量子論

【Code】10C004 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Thu 2nd

【Location】Bldg.No.1-Nuclear Engineering Sminar Room 1 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】We study basics of quantum field theories as introduction to particle physics, condensed matter and quantum optics.

【Grading】examination

【Course Goals】We aim to understand that the dual feature of wave and particle in the microscopic physical world is described systematically in terms of the quantization of fields.

【Course Topics】

Theme	Class number of times	Description
Quantization of free fields	8	We present a detailed description for the quantization of free fields.
Interactions among quantized fields	6	We introduce interaction among fields, and describe the elementary processes for particles such as electron and phonon. Then, we consider transtion prcesses in terms of perturbative expantion, providing the Feynman propagaters and diagrams.

【Textbook】

【Textbook(supplemental)】Quantum Field Theory (Itzykson and Zuber)

【Prerequisite(s)】Analysis, linear algebra, electromagnetism, quantum mechanics

【Web Sites】

【Additional Information】

10R013

Nonlinear Physics in Fusion Plasmas

非線形プラズマ工学

【Code】10R013 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 2nd

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	2	
	2	
	3	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C078

Hybrid Advanced Accelerator Engineering

複合加速器工学

【Code】10C078 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 3rd

【Location】Bldg.No.1-Nuclear Engineering 2 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	3	
	1	
	2	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C047

Radiation Medical Physics

放射線医学物理学

【Code】10C047 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Fri 3rd

【Location】Bldg.No.1-Nuclear Engineering Sminar Room 1 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture【Language】Japanese【Instructor】Yoshinori Sakurai, Tooru Kobayashi, Hiroki Tanaka

【Course Description】Medical physics is the general term for the physics and technology which are supporting radiation diagnosis and therapy, and particle therapy. As it covers many different fields, the important subjects are “promotion for the advance of radiation therapy” and “quality assurance for radiation therapy”. The scope of this course is to learn the fundamental knowledge for radiation medical physics. Especially, the focus is put on the understanding for (1) the bases of physics, biology and so on for radiation, (2) the physics for the radiations applied to diagnosis, (3) the characteristics of radiations and particle beams applied to therapy, and (4) the radiation protection, quality assurance and so on for radiation diagnosis and therapy.

【Grading】Attendance and reports

【Course Goals】To learn the fundamental knowledge of medical physics, mainly for radiation physics in diagnosis and therapy

【Course Topics】

Theme	Class number of times	Description
Fundamental physics for radiation	2	
Radiation biology	1	
Radiation measurement and evaluation	2	
Physics in radiation diagnosis	3	
Physics in radiation therapy	4	
Quality assurance and standard dosimetry	1	
Radiation protection	1	

【Textbook】Not specified. Handouts will be given for each topic.

【Textbook(supplemental)】F.M.Khan, “The Physics of Radiation Therapy: Mechanisms, Diagnosis, and Management” (Lippincott Williams & Wilkins, Baltimore, 2003)

【Prerequisite(s)】It is recommended to attend the course, “Radiation Measurement for Medicine”, concurrently.

【Web Sites】

【Additional Information】According to the lecture frequency in the said year, some of the topics can be omitted or new topics can be added.

10C017

Radiation Physics and Engineering

放射線物理工学

【Code】10C017 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Mon 1st

【Location】Bldg.No.1-Nuclear Engineering 2 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	4-5	
	2	
	2	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C074

Quantum Science

量子科学

【Code】10C074 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Fri 2nd

【Location】Bldg.No.1-Nuclear Engineering 2 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	6	
	6	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C018

Neutron Science

中性子科学

【Code】10C018 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 3rd

【Location】Bldg.No.1-Nuclear Engineering 2 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	6	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R001

Quantum Beam Science, Adv.

量子ビーム科学特論

【Code】10R001 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Fri 4th

【Location】Engineering Science Depts Bldg.-213 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R004

Quantum Physics, Adv.

量子物理学特論

【Code】10R004 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Fri 2nd

【Location】Bldg.No.1-Nuclear Engineering Sminar Room 1 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】We study advanced quantum theories and their applications to technologies including quantum optics and quantum information.

【Grading】Presentations and discussions concerning the textbook

【Course Goals】We introduce recent progresses of techonogies based on quantum dynamics.

【Course Topics】

Theme	Class number of times	Description
Quantum theories and their applications	14	We study a relevant textbook and related topics.

【Textbook】A relevant textbook is instructed at the beginning of the class every year.

【Textbook(supplemental)】

【Prerequisite(s)】Electromagnetism, atomic physics, quantum physics

【Web Sites】

【Additional Information】

10W620

Radiation Measurement for Medicine

医学放射線計測学

【Code】10W620 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 4th

【Location】Bldg.No.1-Nuclear Engineering Sminar Room 1 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Hidetsugu Tsuchida, Yoshinori Sakurai

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1 ～ 2	
	1 ～ 2	
	1	
	1	
	1 ～ 2	
	1 ～ 2	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C089

Seminar on Nuclear Engineering A, B

原子核工学セミナーA

【Code】10C089 【Course Year】Master Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C090

Seminar on Nuclear Engineering A, B

原子核工学セミナー B

【Code】10C090 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C063

Experiments and Exercises on Nuclear Engineering, Adv. I

原子核工学特別実験及び演習第一

【Code】10C063 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】Mon 1st and 2nd

【Location】 【Credits】4 【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C064

Experiments and Exercises on Nuclear Engineering, Adv. II

原子核工学特別実験及び演習第二

【Code】10C064 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R019

Seminar on Nuclear Engineering, Adv. A

原子核工学特別セミナーA

【Code】10R019 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R021

Seminar on Nuclear Engineering, Adv. A

原子核工学特別セミナーB

【Code】10R021 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R023

Seminar on Nuclear Engineering, Adv. A

原子核工学特別セミナー C

【Code】10R023 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R025

Seminar on Nuclear Engineering, Adv. A

原子核工学特別セミナーD

【Code】10R025 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R027

Seminar on Nuclear Engineering, Adv. A

原子核工学特別セミナーE

【Code】10R027 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R029

Seminar on Nuclear Engineering, Adv. A

原子核工学特別セミナーF

【Code】10R029 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K001

Introduction to Advanced Material Science and Technology

先端マテリアルサイエンス通論

【Code】10K001

【Course Year】Special Auditors, Special research Students, Graduate School Students (inc. International Course Students)

【Term】1st term

【Class day & Period】Starting from April 15, the lecture will be held from 2:45 p.m. to 4:15 p.m. on Friday afternoon but some lectures are from 4:30 p.m.

【Location】Distance lectures are held between Lecture Room 1 in Engineering Bld. 8 at Yoshida campus and Seminar Room 131 in Bld. A1 at Katsura campus. Attend either of them at your convenience.

【Credits】2 【Restriction】 【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】The various technologies used in the field of material science serve as bases for so-called "high technologies", and, in turn, the high technologies develop material science. These relate to each other very closely and contribute to the development of modern industries. In this class, recent progresses in material science are briefly introduced, along with selected current topics on new biomaterials, nuclear engineering materials, new metal materials and natural raw materials. The methods of material analysis and future developments in material science are also discussed.

【Grading】In order to obtain two credits, students must attend at least ten lectures, and at least five of the submitted reports must be evaluated as “passed” by each lecturer. Each report should be submitted to the lecturer within two weeks after his/her lecture. NOTE: Reports are NOT acceptable from those who do not attend the lecture.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	15	

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C031

Quantum Manipulation Technology

量子制御工学

【Code】10C031 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 3rd

【Location】Bldg.No.1-Nuclear Engineering 2 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	12	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C046

Radiation Biology and Medicine

放射線生物医学

【Code】10C046 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C277

Internship M for Materials Science & Engineering

インターンシップM（材料工学）

【Code】10C277 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D051

Frontiers in Modern Science & Technology

現代科学技術の巨人セミナー「知のひらめき」

【Code】10D051 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 5th

【Location】Katsura Hall 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R241

Seminar on Materials Science and Engineering, Adv. B

材料工学特別セミナーA

【Code】10R241 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R242

Seminar on Materials Science and Engineering, Adv. B

材料工学特別セミナーB

【Code】10R242 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R243

Seminar on Materials Science and Engineering, Adv. C

材料工学特別セミナーC

【Code】10R243 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R244

Seminar on Materials Science and Engineering, Adv. D

材料工学特別セミナーD

【Code】10R244 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R245

Seminar on Materials Science and Engineering, Adv. E

材料工学特別セミナーE

【Code】10R245 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R247

Seminar on Materials Science and Engineering, Adv. A ～ F

材料工学特別セミナーF

【Code】10R247 【Course Year】【Term】2nd term 【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C205

Thermodynamics for Materials Science, Adv. A

材料熱力学特論A

【Code】10C205 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 2nd

【Location】Engineering Science Depts Bldg.-112 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Thermodynamics and Elasticity	2	
Generalization of thermodynamic potneitals	3	
Basic of micromechanics	2	
Basic of statistical thermodyanamics	1	
Statistical physics of lattice	3	
Landau's phenomenology for phase transtision	2	
Basic science of glasses	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C271

Magnetism and magnetic materials

磁性物理

【Code】10C271 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】Integrated Research Bldg.-111 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	8	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C273

Social Core Advanced Materials I

社会基盤材料特論 I

【Code】10C273 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 4th

【Location】Engineering Science Depts Bldg.-112 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C275

Social Core Advanced Materials ＩＩ

社会基盤材料特論II

【Code】10C275 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Tue 4th

【Location】Engineering Science Depts Bldg.-112 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C267

Ceramic Materials Science

セラミックス材料学

【Code】10C267 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Thu 2nd

【Location】Engineering Science Depts Bldg.-112 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	3	
	2	
	2	
	2	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C294

Integrated Molecular Science IV

統合物質科学IV

【Code】10C294 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】Faculty of Science Bldg.No.6 Room402 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Relay Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C296

Integrated Materials Science IV

統合材料科学IV

【Code】10C296 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 3rd

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C283

International Student Seminar on Integrated Materials

統合物質科学学生国際セミナー

【Code】10C283 【Course Year】Doctor Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Intensive Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C234

Physics of Mesoscopic Materials

メゾ材料物性学

【Code】10C234 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】Engineering Science Depts Bldg.-112 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Akira Sakai, Shu Kurokawa

【Course Description】The first half of the lecture explains the mesoscopic phenomena, a variety of electronic transport phenomena observed in a nano- or atomic-scale specimen that is smaller in size than the mean free path of electrons. The second half covers scanning probe microscopy (SPM), a powerful observation tool widely exploited in nanotechnology. Principles of various types of SPM and their applications in materials science are exposited with many illustrative examples.

【Grading】Grading will be made based on the report on the assigned problems.

【Course Goals】The final goal of this lecture is to make students acquire basic understanding on the mesoscopic phenomena and the characterization of materials with SPM.

【Course Topics】

Theme	Class number of times	Description
Mesocopic electron transport phenomena	7	1. Introduction to electronic conduction 2. Quantum interference between electrons and its influence on electronic conduction 3. Ballistic conduction 4. Single-electron tunneling 5. Electron transport through atom-sized contacts of metals 6. Electron transport through single molecules 7. Newest topics of mesoscopic electronic conduction
Materials characterization with SPM	8	1. Atomic and electronic structures of surfaces 2. Properties of tunneling electrons 4. Forces acting across ultrasmall junctions 5. Materials characterization with SPM (1) 6. Materials characterization with SPM (2) 7. Materials characterization with SPM (3) 8. Cutting-edge SPM researches

【Textbook】Lacture notes in a paper form will be distributed.

【Textbook(supplemental)】

【Prerequisite(s)】Prerequisite courses: "Solid state physics", or equivalent, in the undergraduate course.

【Web Sites】

【Additional Information】

10C287

Nano-Structural Properties of Materials

ナノ構造物性学

【Code】10C287 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 2nd

【Location】Engineering Science Depts Bldg.-112 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1-2	
	1-2	
	2-3	
	1-2	
	3-4	
	1-2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C263

Physical Properties of Crystals Adv.

結晶物性学特論

【Code】10C263 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C251

Seminar on Materials Science and Engineering A

材料工学セミナーA

【Code】10C251 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 4th 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C253

Seminar on Materials Science and Engineering B

材料工学セミナーB

【Code】10C253 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 4th 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C240

Laboratory & Seminar in Materials Science and Engineering, Adv. Ⅰ

材料工学特別実験及演習第一

【Code】10C240 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】Tue and Thu, 3ed

【Location】【Credits】4【Restriction】【Lecture Form(s)】Seminar and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C241

Laboratory & Seminar in Materials Science and Engineering, Adv.II

材料工学特別実験及演習第二

【Code】10C241 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C230

Nanoscopic Assembly and Integration of Materials

集積化材料工学

【Code】10C230 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Fri 2nd

【Location】Engineering Science Depts Bldg.-112 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	2	
	5	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K004

New Engineering Materials, Adv.

新工業素材特論

【Code】10K004 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 5th

【Location】(Katsura)A1-131 (Yoshida)Lecture Room3,Reseach Bldg.No.4 【Credits】2 【Restriction】

【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	Composite Materials: Smart, Lightweight and Strong Materials (HOJO)
	1	Innovations in High Performance Steels for Bridge Construction (SUGIURA)
	1	Materials in Micro Electro Mechanical Systems (MEMS) (TSUCHIYA)
	1	High Temperature Superconductivity and Its Application to Electronics(SUZUKI)
	1	Sustainability Issues(SHIMIZU)
	1	Material Properties of Fiber Reinforced Cementitious Composites and Applicability to Structures (KANEKO)
	1	Structural biochemistry of proteins (SHIRAKAWA)
	2	Semiconductor Materials and Devices (KIMOTO)
	1	Separation Analysis in Micro- and Nano-scale (OTSUKA)
	1	Polymer Synthesis beyond the 21st Century:Precision Polymerizations and Novel Polymeric Materials (SAWAMOTO)
	1	Inorganic New Materials (EGUCHI)

【Textbook】

【Textbook(supplemental)】Class handouts

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K001

Introduction to Advanced Material Science and Technology

先端マテリアルサイエンス通論

【Code】10K001

【Course Year】Special Auditors, Special research Students, Graduate School Students (inc. International Course Students)

【Term】1st term

【Class day & Period】Starting from April 15, the lecture will be held from 2:45 p.m. to 4:15 p.m. on Friday afternoon but some lectures are from 4:30 p.m.

【Location】Distance lectures are held between Lecture Room 1 in Engineering Bld. 8 at Yoshida campus and Seminar Room 131 in Bld. A1 at Katsura campus. Attend either of them at your convenience.

【Credits】2 【Restriction】 【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】The various technologies used in the field of material science serve as bases for so-called "high technologies", and, in turn, the high technologies develop material science. These relate to each other very closely and contribute to the development of modern industries. In this class, recent progresses in material science are briefly introduced, along with selected current topics on new biomaterials, nuclear engineering materials, new metal materials and natural raw materials. The methods of material analysis and future developments in material science are also discussed.

【Grading】In order to obtain two credits, students must attend at least ten lectures, and at least five of the submitted reports must be evaluated as “passed” by each lecturer. Each report should be submitted to the lecturer within two weeks after his/her lecture. NOTE: Reports are NOT acceptable from those who do not attend the lecture.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	15	

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C232

Composite Materials

複合材料学

【Code】10C232 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 2nd

【Location】Engineering Science Depts Bldg.-112 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】S. Ochiai and H. Okuda

【Course Description】High functionalities that cannot be achieved by monolithic material can be realized by combining different kinds of materials. Machanims and required conditions to realize high functionality by assembling different materials, characterization of composite materials, designing and fabrication method of high performanec composites and application of coposite materials to inductry are presented.

【Grading】Attendance and reports

【Course Goals】Fundamental understanding of mechanism of composite effects, and chracterization and desining methods of composite materials to achieve high performance.

【Course Topics】

Theme	Class number of times	Description
Funtion and design of composite materials (Ochiai)	7	Why and how the high functionality is realized by assembling dissimilar materails, what kinds of condition shall be sasisfied to realize the high fucntionality, what is imporatnt in designing of composite materials and where the composites are used in the engineering filed are to be explained.
Nanostructure analysis of composites	7	Structure analysis methods in meso- to nanostructural composite materials will be presented with emphasis on the use of X-ray (SR) scattering methods.

【Textbook】Prints for the concenred items are distributed to all students.

【Textbook(supplemental)】Not appointed.

【Prerequisite(s)】Mechanics, Electro-magnetics, Material structures

【Web Sites】

【Additional Information】

10C210

Material and Chemical Information Analysis

物質情報工学

【Code】10C210 【Course Year】Master Course 【Term】1st term 【Class day & Period】Thu 2nd

【Location】Integrated Research Bldg.-111 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	4	
	2	
	1	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C291

量子材科学特論

【Code】10C291 【Course Year】 【Term】1st term 【Class day & Period】Wed 2nd 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C294

Integrated Molecular Science IV

統合物質科学IV

【Code】10C294 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】Faculty of Science Bldg.No.6 Room402 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Relay Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C296

Integrated Materials Science IV

統合材料科学IV

【Code】10C296 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 3rd

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C259

Random Structure Materials

ランダム構造物質学特論

【Code】10C259 【Course Year】Master Course 【Term】 【Class day & Period】Tue 1st

【Location】Engineering Science Depts Bldg.-112 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】MATSUBARA Eiichiro

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1-5	
	6-7	
	8-10	
	11-12	
	13-14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C206

Thermodynamics for Materials Science, Adv. B

材料熱力学特論Ｂ

【Code】10C206 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Fri 2nd

【Location】Engineering Science Depts Bldg.-112 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	3	
	3	
	3	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.aqua.mtl.kyoto-u.ac.jp/

【Additional Information】

10C213

Physical Properties of Thin Films

マイクロ材料機能学

【Code】10C213 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Tue 3rd

【Location】Engineering Science Depts Bldg.-312 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Kazuhiro ITO

【Course Description】Thin films are common in electric and magnetic devises and formed on substrates. Thin film materials are usually different from substrate materials, and thus controling the interface such as adherence, chemical reaction, and so on is essential for making reliable devices. In this course, deposition methods, characterization of film properties and microstructures, and the latest research topice are interpreted.

【Grading】Reports

【Course Goals】General deposition methods, and characterization of film properties and microstructures are learned. The latest research topics concerned with metallurgy in the thin film devices are understanded.

【Course Topics】

Theme	Class number of times	Description
Review of deposition methods	3	Deposition methods of thin films is basically interpreted.
Thin film properties	4	Nucleation and growth of thin films and film properties such as electric and mechanical properties are basically interpreted.
Characterization of film microstructures	3	Characterization of thin films using XRD, SEM and TEM is interpreted.
The latest research topics in thin film devices	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Attending Thin Film Materials is necessary when you are an undergraduate

【Web Sites】

【Additional Information】A few units are supposed to be omitted or added.

10C289

Advanced Structural Metallic Materials

先進構造材料特論

【Code】10C289 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】Engineering Science Depts Bldg.-112 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	8	
	6	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C643

Advanced Experiments and Exercises in Electrical Engineering Ⅰ，Ⅱ

電気工学特別実験及演習 1

【Code】10C643 【Course Year】Master 1st 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C646

Advanced Experiments and Exercises in Electrical Engineering II

電気工学特別実験及演習２

【Code】10C646 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R610

Advanced Electrical Engineering Seminar

電気工学特別セミナー

【Code】10R610【Course Year】【Term】1st+2nd term【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C628

State Space Theory of Dynamical Systems

状態方程式論

【Code】10C628 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 3rd

【Location】A1-131 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】T. Hagiwara, Y. Ebihara

【Course Description】The course deals with the dynamical system theory based on linear time-invariant state equations. It covers such topics as state equations, controllability and observability, mode decomposition and its relevance to controllability/observability, stability of dynamical systems, and the Kalman canonical decomposition.

【Grading】The grading will be based on the exam.

【Course Goals】To acquire the knowledge on the basic theory for linear system analysis by means of state equations.

【Course Topics】

Theme	Class number of times	Description
feedback systems and state equations	3 〜 4	fundamentals of state equations, their relationship to transfer functions and block diagram representations
responses of linear systems	5 〜 6	state transition matrices, equivalence transformation of systems, mode decomposition and Lyapunov stability
controllability and observability	5 〜 6	controllability and observability, mode decomposition and its relevance to controllability/observability, controllable subspace and unobservable subspace, and the Kalman canonical decomposition

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】classical control theory (in terms of transfer functions), linear algebra and calculus

【Web Sites】

【Additional Information】Handouts will be given at the class.

10C604

Applied Systems Theory

応用システム理論

【Code】10C604 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Tue 1st

【Location】A1-001 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】E. Furutani

【Course Description】The course deals with mathematical methods of system optimization mainly for combinatorial optimization problems. It covers such topics as the integer optimization and its typical problems, exact solution methods including the dynamic programming and the branch and bound method, approximate solution methods including the greedy method, meta-heuristics including the genetic algorithms, the simulated annealing method, and the tabu search.

【Grading】The grading will be based on an exam and the evaluation of the reports on the subjects given in the class.

【Course Goals】To acquire the knowledge on formulation of combinatorial optimization problems into integer programming problems, basic concepts, algorithms, characteristics, and application procedures of exact solution methods, approximate solution methods, and meta-heuristics.

【Course Topics】

Theme	Class number of times	Description
combinatorial optimization	1	necessity and importance of combinatorial optimization, and typical problems
exact solution methods	3	principle of optimality, dynamic programming, branch and bound method, and their applications
integer programming	2-3	formulation into integer programming problem, relaxation problem, and cutting plane algorithm
complexity	1	complexity, classes P and NP, complexity of combinatorial optimization problems, necessity of approximate solution methods and meta-heuristics
approximate solution methods	1-2	greedy method, relaxation method, partial enumeration method, etc.
meta-heuristics	4-5	local search, basic ideas of meta-heuristics, genetic algorithms, simulated annealing method, tabu search, etc.

【Textbook】

【Textbook(supplemental)】M. Fukushima: Introduction to Mathematical Programming (in Japanese), Asakura, 1996.

Y. Nishikawa, N. Sannomiya, and T. Ibaraki: Optimization (in Japanese), Iwanami, 1982.

M. Yagiura, and T. Ibaraki: Combinatorial Optimization ---With a Central Focus on Meta-heuristics--- (in Japanese), Asakura, 2001.

B. Korte, and J. Vygen: Combinatorial Optimization ---Theory and Algorithms, Third Edition, Springer, 2006.

【Prerequisite(s)】linear programming, nonlinear programming

【Web Sites】

【Additional Information】Handouts and exercises are given at the class.

10C647

Electrical and Electromagnetic Circuits

電気電磁回路論

【Code】10C647 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Wed 2nd

【Location】A1-001 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Osami Wada

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	8	
	4	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C610

Electromagnetic Theory, Adv.

電磁気学特論

【Code】10C610 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Wed 3rd

【Location】A1-001 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】T. Matsuo

【Course Description】The first half: computational electromagnetics
The latter half: the special theory of relativity and the covariance of Maxwell's equations

【Grading】Submission of reports (twice)

【Course Goals】1. Understanding of computational methods for electromagnetic field analysis
2. Understanding of the basic concepts of special theory of relativity and the covariant formulation of Maxwell's equations

【Course Topics】

Theme	Class number of times	Description
Finite element method for magnetic field analysis	2-3	- Introduction to finite element analysis for magnetic field analysis - Edge element for three-dimensional magnetic field analysis
Finite integration method for electromagnetic field analysis	3-4	- Introduction to finite integration method - Application to electromagnetic field analysis
Introduction to special theory of relativity	2-3	- Galilean relativity and special relativity - Lorentz transformation
Tensor representation and relativistic dynamics	2-3	- Introduction to tensor representation - Relativistic dynamics
Covariant formulation of Maxwell’s equations	2	- Electromagnetic field tensor - Lorentz covariance of Maxwell’s equations

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Basic electromagnetic theory

【Web Sites】

【Additional Information】

10C613

Superconductivity Engineering

超伝導工学

【Code】10C613 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 4th

【Location】A1-001 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】,

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C614

Biological Function Engineering

生体機能工学

【Code】10C614 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Wed 2nd

【Location】A1-001 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Tetsuo Kobayashi

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Basics of nervous system	3	
Neurones and glial cells	1	
Neuroimaging techniques	6	
Visual functions	3	
Auditory functions	1	
Motor functions	1	

【Textbook】

【Textbook(supplemental)】Tetsuo Kobayashi, Isamu Ozaki and Ken Nagata (eds.): "Brain topography and multimodal imaging", (Kyoto Univ. Press, 2009)

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C625

Theory of Electric Circuits, Adv.

電気回路特論

【Code】10C625 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 1st 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	4	
	4	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C631

Design of Control Systems

制御系設計理論

【Code】10C631 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 2nd

【Location】A1-001 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】T. Hagiwara, Y. Ebihara

【Course Description】The course is based on State Space Theory of Dynamical Systems, and provides the applications of the concepts given therein to systematic control system design. The course covers such topics as state feedback and pole assignment, observers, synthesis of feedback control systems, servo conditions and feedforward, and optimal control under quadratic performance indices.

【Grading】In principle, the grading will be based on the absolute and comprehensive evaluation of the reports on the subjects given in the class. Should this change due to inadequate efforts on the submitted reports, an exam might be also imposed, in which case the details will be announced at the class at least two weeks before the exam term.

【Course Goals】To understand the basic ideas of control system design based on state space representations, and acquire fundamental knowledge and skills on practical control system design through simulated experiences with the report subjects.

【Course Topics】

Theme	Class number of times	Description
pole assignment by state feedback	4 ～ 5	state feedback, controllable canonical forms and pole assignment of scalar/multivariable systems, computation of the state feedback gains for pole assignment, transient responses, uncontrollable poles and stabilizability
observers	3 ～ 4	observable canonical forms and observability conditions, full-order observer, minimal-order observer, conditions for observers and observer-based feedback
synthesis of feedback systems	2 ～ 3	feedback systems with integral compensation, servo systems, internal model principle, synthesis of servo systems
optimal control under quadratic performance index	3 ～ 4	optimal regulators and their closed-loop poles, Riccati equations and their solutions, relationship with the pole assignment problem

【Textbook】Handouts will be given at the class.

【Textbook(supplemental)】

【Prerequisite(s)】The contents given in State Space Theory of Dynamical Systems, and linear algebra.

【Web Sites】(Info) http://www-lab22.kuee.kyoto-u.ac.jp/~hagiwara/ku/matlab-octave.html

【Additional Information】

10C611

Computer Simulations of Electrodynamics

電磁界シミュレーション

【Code】10C611 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Tue 5th

【Location】A1-101/Electrical Engineering Bldg.-Lecture Room (M)/Uji Campus(Remote Lecture Room)

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English 【Instructor】,

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C612

Space Radio Engineering

宇宙電波工学

【Code】10C612 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 3rd

【Location】N1 lecture room in the Faculty of engineering building No. 3, A1-131 in Katsura campus, Uji

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Hiroshi Yamakawa, Hirotsugu Kojima

【Course Description】The present lecture provides the guideline how the technology on the electronics and propulsion system is used for the development of spacecraft and space systems. Furthermore, in order to understand the environment in space, we also give a lecture on the space plasma physics.

【Grading】attendance and reports

【Course Goals】Mastery of the way how we can make use of the knowledges of the physics and technology to the space engineering.

【Course Topics】

Theme	Class number of times	Description
Plasma physics/Magnetospheric physics	7	Plasma physics which are closely related to the magnetospheric physics
Space environment	3	The space environment in the view point of spacecraft desing such as thermal condition, plasmas, and charging.
Spacecraft systema and its related technology	4	The spacecraft system and its technology related to power system, communication system, EMC, and payload desings.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Plasma physics, Electromagnetics. Radio engineering, Electronics

【Web Sites】

【Additional Information】

10C617

Applied Microwave Engineering

マイクロ波応用工学

【Code】10C617 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 4th

【Location】A1-101/Electrical Engineering Bldg.-Lecture Room (M)/Uji Campus 【Credits】2 【Restriction】

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】(RISH) Shinohara

【Course Description】This lecture picks up microwave power transmission (MPT) technology, rectifying antenna (rectenna), antenna and propagation for the MPT, microwave transmitters, and some MPT applications like the Space Solar Power Satellite/Station. This lecture also picks up the other wireless power transmission technologies like resonnance coupling, energy harvesting, and applied microwave technologies of microwave processing, wireless communications, and radar.

【Grading】Reports

【Course Goals】Students learn about applied microwave engeering, mainly microwave power transmission.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	The purpose and constitution of the lecture, and review of microwave engineering are explained.
Applications of Wireless Power Tramsmission	3-4	Space Solar Power Satellite/Station and Ubiquitous power source as applications of microwave power transmission, the resonance coupling and energy harvesting as the other battery-less technologies are explained.
rectifying antenna (rectenna)	1-2	rectifying antenna (rectenna) for the MPT are explained.
antenna and propagation for the MPT	5-6	Calculation of beam collection efficiency and beam propagation with FDTD method are explained. Phased array technologies, beam targetting method, non linear physics of microwave-plasma interation are overviwed.
Microwave transmitters	2	High efficient semi-conductor amplifiers and microwave tubes are explained.
microwave processing, wireless communications, and radar	1	Microwave processing, wireless communications, and radar texhnologies are explained.

【Textbook】Non. Hand out will be distributed.

【Textbook(supplemental)】

【Prerequisite(s)】Microwave engineering

【Web Sites】

【Additional Information】Number of the lectures may change.

10C714

Spacio-Temporal Media Analysis

時空間メディア解析特論

【Code】10C714 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 3rd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1-2	
	2	
	1-2	
	1-2	
	1-2	
	2	
	1-2	
	0-2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C716

Visualized Simulation Technology

可視化シミュレーション学

【Code】10C716 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 4th 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1-2	
	2-3	
	2-3	
	3-4	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K010

Recent Advances in Electrical and Electronic Engineering

先端電気電子工学通論

【Code】10K010 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Tuesday, 5

【Location】Laboratories 【Credits】2 【Restriction】Foreig students 【Lecture Form(s)】Seminar

【Language】English 【Instructor】

【Course Description】The class consists of a series of seminars at 3 laboratories related to Department of Electrical and Electronic Engineering (energy and electrical machinery, computers, control and systems, communications and radio engineering, and electronic devices and applied physics). Each seminar intends to give a brief introduction into a specific research field so that students can get a feel for the state-of-the-art in each topic and broaden their scope beyond their majors.

【Grading】The evaluation of a student’s work is given based on his/her attendance, reports and discussions, not on examinations.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693622

Digital Communication Engineering

ディジタル通信工学

【Code】693622 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Thu 2nd

【Location】Electrical Engineering Bldg.-Lecture Room (M) 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	3-4	
	2	
	1	
	2-3	
	2-3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693628

Information Network

情報ネットワーク

【Code】693628 【Course Year】 【Term】1st term 【Class day & Period】Tue 2nd

【Location】Electrical Engineering Bldg.-Lecture Room (M) 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】http://www.i.kyoto-u.ac.jp/curriculum/syllabus.html

10X001

Prospects of Interdisciplinary Photonics and Electronics

融合光･電子科学の展望

【Code】10X001 【Course Year】 【Term】1st term 【Class day & Period】Fri 2nd 【Location】A1-131

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C718

Advanced Seminar in Electrical Engineering I

電気工学特別研修１(インターン)

【Code】10C718 【Course Year】Master Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C720

Advanced Seminar in Electrical Engineering II

電気工学特別研修２(インターン)

【Code】10C720 【Course Year】Master Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C627

Research Internship(M)

研究インターンシップ M

【Code】10C627【Course Year】【Term】1st+2nd term【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R630

Research Internship (M, D)

研究インターンシップ D

【Code】10R630【Course Year】【Term】1st+2nd term【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R632

Advanced Exercises on Electrical Engineering I, II

電気工学特別演習 1

【Code】10R632【Course Year】【Term】1st+2nd term【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R633

Advanced Exercises on Electrical Engineering I, II

電気工学特別演習 2

【Code】10R633【Course Year】【Term】1st+2nd term【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D051

Frontiers in Modern Science & Technology

現代科学技術の巨人セミナー「知のひらめき」

【Code】10D051 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 5th

【Location】Katsura Hall 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D040

Exercise in Practical Scientific English

実践的科学英語演習「留学ノススメ」

【Code】10D040 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】Seminar 【Language】English 【Instructor】Kenji Wada. etc

【Course Description】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Grading】Attendance 60%, midterm reports 20%, final report 20%. The final report must be submitted by the deadline date.

【Course Goals】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Course Guidance, etc.
Exercise-1	1	Definition of technical writing 3C in technical writing Weaknesses of Japanese writers Good examples and bad examples
Exercise-2	1	Punctuation Presentation skills 1 -organization
Exercise-3	1	Organizing your thoughts for the title and abstract Presentation skills 2 ?Visual aspects
Exercise-4	1	Presenting the background of your research Presentation skills 3 ?Oral Aspects
Exercise-5	1	Describing how you did your research Presentation skills 4 ?Physical Aspects
Exercise-6	1	Presenting what you observed Presentation Practice
Exercise-7	1	Placing your findings in the field Presentation Practice
Exercise-8	1	Expressing thanks and listing references Presentation practice
Exercise-9	1	Writing your proposal Presentation practice
Exercise-10	1	Presentation practice Reviews & Feedbacks Evaluation
Wrap-up lecture	1~2	Current situation of studying abraod, etc.

【Textbook】No textbook is required.

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.ehcc.kyoto-u.ac.jp/alc/ (needs passwords).

【Additional Information】For details, contact Dr. Wada (wadaken@scl.kyoto-u.ac.jp).

10K001

Introduction to Advanced Material Science and Technology

先端マテリアルサイエンス通論

【Code】10K001

【Course Year】Special Auditors, Special research Students, Graduate School Students (inc. International Course Students)

【Term】1st term

【Class day & Period】Starting from April 15, the lecture will be held from 2:45 p.m. to 4:15 p.m. on Friday afternoon but some lectures are from 4:30 p.m.

【Location】Distance lectures are held between Lecture Room 1 in Engineering Bld. 8 at Yoshida campus and Seminar Room 131 in Bld. A1 at Katsura campus. Attend either of them at your convenience.

【Credits】2 【Restriction】 【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】The various technologies used in the field of material science serve as bases for so-called "high technologies", and, in turn, the high technologies develop material science. These relate to each other very closely and contribute to the development of modern industries. In this class, recent progresses in material science are briefly introduced, along with selected current topics on new biomaterials, nuclear engineering materials, new metal materials and natural raw materials. The methods of material analysis and future developments in material science are also discussed.

【Grading】In order to obtain two credits, students must attend at least ten lectures, and at least five of the submitted reports must be evaluated as “passed” by each lecturer. Each report should be submitted to the lecturer within two weeks after his/her lecture. NOTE: Reports are NOT acceptable from those who do not attend the lecture.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	15	

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C601

Applied Mathematics for Electrical Engineering

電気数学特論

【Code】10C601 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 1st

【Location】A1-001 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】T. Hikihara & S. Doi

【Course Description】In the class, fundamental mathematics is lectured for electrical engineering, electronics, system engineering, and material science. In particular, system theory, nonlinear dynamics, and particle dynamics in force field can be discussed with mathematical clear image.

【Grading】Students are requested to reply to report assignments. The grading is based on the evaluation of the reports.

【Course Goals】Professors expect students to model their system and analyze the models theoretically. Students will be requested to understand their system in principle mechanics and control them based on system theory.

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	3	
Introduction 2	1	Relationship between the previous classes and further will be explained. The introduction to nonlinear dynamics will be explained based on oscillation theory.
Hamiltonian mechanics	4	Hamiltonian mechanics on linear symplectic space is lectured.
Manifold and vector field	3	Manifold is discussed in nonlinear system with relation to vector filed analysis.

【Textbook】

【Textbook(supplemental)】S. Wiggins, Introduction to Applied Nonlinear Dynamical Systems and Chaos, Springer-Verlag.

【Prerequisite(s)】Linear algebra

【Web Sites】https://www.t.kyoto-u.ac.jp/lecturenotes/gse/kueeng/10C601/syllabus

【Additional Information】Appropriate references will be shown in classes.

10C621

Applied Hybrid System Engineering

応用ハイブリッドシステム工学

【Code】10C621 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 1st

【Location】A1-001 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Takashi Hikihara, Shinji Doi, Yoshihiko Susuki, Syunichi Azuma

【Course Description】In the class, we will focus on hybrid systems consisting of continuous and discrete dynamics. Modeling, analysis, and control theory are lectured.

【Grading】Reports for each topics are evaluated. The reports without attending the class are not accepted.

【Course Goals】The comprehension to hybrid systems and applications of the theory are aimed in the class.

【Course Topics】

Theme	Class number of times	Description
Fundamentals of Hybrid system	4	Modeling of hybrid system, consisting of continuous and discrete dynamics, is lectured based on hybrid automaton. Some examples are shown.
Fundamentals of perturbation method and asymptotic expansion	3	Perturbation theory and asymptotic expansion method are lectured. In addition, analytical and geometrical perturbation methods are lectured for understanding global dynamics of system.
Application of hybrid system theory - I	3	The application to power system is lectured. After the explanation of fundamentals of power system, safety, modeling, problem setting, and simulation method are focused.
Analysis and design of dynamic quantizers	2	System with quantizer is lectured. The analysis and design of the system is the main topics of the lecture.
Application of hybrid system theory - II	2	The application to communication system is picked up. The packet transfer in the network is discussed based on the hybrid system theory.

【Textbook】Prints are distributed.

【Textbook(supplemental)】In the class, appropriate textbooks are indicated.

【Prerequisite(s)】Knowledge of mathematics and control theory at under graduate school.

【Web Sites】

【Additional Information】Attending class is substantial to submit reports.

10C710

Advanced Experiments and Exercises in Electronic Science and Engineering Ⅰ，Ⅱ

電子工学特別実験及演習 1

【Code】10C710 【Course Year】Master 1st 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C713

Advanced Experiments and Exercises in Electronic Science and Engineering II

電子工学特別実験及演習２

【Code】10C713 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R701

Advanced Seminar on Electronic Science and Engineering

電子工学特別セミナー

【Code】10R701【Course Year】【Term】1st+2nd term【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C825

Quantum Mechanics for Electronics Engineering

量子論電子工学

【Code】10C825 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 3rd

【Location】A1-001 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	1	
	1	
	1	
	1	
	2	
	2	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C801

Charged Particle Beam Apparatus

電子装置特論

【Code】10C801 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Wed 4th

【Location】A1-001 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Yasuhito Gotoh

【Course Description】Fundamental technologies of an ion beam apparatus, such as ion source, formation and evaluation of ion beam, transport of ion beam, and ioni-solid interaction will be presented. Taking ion implantation as one of the example of the ion application, the relationship between the incident ion energy and implantation depth will be presented. Each element of a typical ion beam apparatus is explained in detail.

【Grading】Evaluation will be made with the results of final examination. Achievements of exercises in the class are also taken into consideration.

【Course Goals】To understand the details of an ion beam apparatus: generation, transport and evaluation of an ion beam. Understanding of the entire ion beam apparatus as a system is also purpose of the class.

【Course Topics】

Theme	Class number of times	Description
Ion beam systems and their applications	1	Outline of the class is presented. Physical properties of ions in vacuum are given, and ion beam apparatuses and their application will be introduced with some typical examples.
Ion-solid interaction	3	Interaction between high energy ion and solid atoms are given. Major topics are: how the ions transfer their energy to the target atoms, i.e., how the ions are decelerated in the solid, and relationship between incident ion energy and implantation depth is given.
Generation and transport of ion beam	4	Methods of ion generation for various elements are explained. Important euqations of beam extraction and beam transport are given. Starting with the paraxial ray equation, concept of transfer matrix is given. Finally, some important physical parameters of ion beams are given.
Mass separators and energy analyzers	4	Details of magnetic sector as mass separator are given. Transfer matrix of the mass separator are presented and focusing effect is described. An important parameter of mass resolution is given. Some different kinds of energy analyzers are also introduced.
Design of ion beam system	2	As a summary of the course, design of the simple ion beam system is given. Prior to the design, some important knowledges about vacuum pumps and components are shown.

【Textbook】Yasuhito Gotoh, Charged Particle Beam Appratus, 2011 version (Will be sold at CO-OP shop)

【Textbook(supplemental)】Junzo Ishikawa, Charged Particle Engineering (Corona).

【Prerequisite(s)】Vacuum Electronic Engineering 1, 2 (undergraduate course)

【Web Sites】

【Additional Information】

10C807

Plasma Science and Engineering, Adv.

プラズマ工学特論

【Code】10C807 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 3rd

【Location】A1-001 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Osamu SAKAI

【Course Description】Main regimes of plasma generation such as capacitive-coupled discharges, inductive-coupled discharges, and wave-propagation discharges are investigated and categorized with discussion of wave-heating mechanisms and particle/energy balance equations. These discussions are based on elementary process of atoms and molecules and wave dispersions in a plasma. In addition, various wave modes emerging in a spatiotemporal structure of plasmas are addressed.

【Grading】Judged by regular examination and submitted report sheet. (In some years, regular examination is replaced by a set of report sheets.)

【Course Goals】Reviewing fundamentals of plasma engineering, understandings of industrially-available plasma sources and electromagnetic-wave propagation in a plasma are required.

【Course Topics】

Theme	Class number of times	Description
Fundamentals	2-3	Reviewing fundamentals of plasma engineering, basic phenomena including elementary processes in a plasma are addressed.
Plasma sources	6-7	Based on wave propagation in a plasma, regimes of plasma generation such as capacitive-coupled discharges, inductive-coupled discharges, and wave-propagation discharges are investigated and categorized with discussion of wave-heating mechanisms and particle/energy balance equations.
Electromagnetic wave propagation	5-6	Various wave modes emerging in a spatiotemporal structure of plasmas are addressed; not only gaseous plasmas but also plasmas in solids are discussed.

【Textbook】

【Textbook(supplemental)】F. F. Chen and J. P. Chang, Lecture Notes on Principles of Plasma Processing (Kluwar Academic/Plenum Publishing, New York, 2003)

【Prerequisite(s)】Knowledge addressed in plasma science and engineering in the bachelor course, or similar one corresponding to this subject.

【Web Sites】

【Additional Information】

10C810

Semiconductor Engineering Adv.

半導体工学特論

【Code】10C810 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 3rd

【Location】A1-001 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】This course explores the fundamentals of physics of semiconductors, which are esseantial to understand semiconductor materials and devices.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Band theory	3-4	Electronic Band Structures are discussed. Nearly free electron and tight-binding approachs, k dot p theory, pseudopotential method are explained. Band structures of major semiconductors such as Si and GaAs are also discussed.
	4-5	
	4-6	

【Textbook】

【Textbook(supplemental)】S. M. Sze Physics of Semiconductor Devices (Wiley Interscience)
P.Y.Yu and M. Cardona Fundamentals of Semiconductors (Springer)

【Prerequisite(s)】Semiconductor engineering, quantum mechanics (undergraduate level)

【Web Sites】

【Additional Information】

10C813

Electronic Materials Adv.

電子材料学特論

【Code】10C813 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Thu 2nd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Semiconductors	6-7	
Superconductors	4-5	
Epitaxial growth	3-4	Semiconductor heterostructures are fabricated by using a crystal growth method called "epitaxy". Fundamentals of epitaxial growth are discussed. One of epitaxial growth methods, molecular-beam epitaxy, is discussed in detail.

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C816

Molecular Electronics

分子エレクトロニクス

【Code】10C816 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 2nd

【Location】A1-131 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C819

Surface Electronic Properties

表面電子物性工学

【Code】10C819 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 5th

【Location】A1-001 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	3	
	6	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C822

Optical Properties and Engineering

光物性工学

【Code】10C822 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 4th

【Location】A1-001 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C828

Quantum Optoelectronics Devices

光量子デバイス工学

【Code】10C828 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 4th

【Location】A1-001 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C830

Quantum Measurement

量子計測工学

【Code】10C830 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 4th

【Location】A1-131 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】As an example of high precision measurements using quantum phenomena, frequency standards, which is realized with the smallest uncertainty in all measurement quantities at present, are discussed. The principle and evaluation of frequency standards are explained.

【Grading】Report(two times, at the first lecture and the after all lectures)

【Course Goals】The goal of this lecture is to understand that precision measurements are realized with combination of the best technologies and is based on physics.

【Course Topics】

Theme	Class number of times	Description
Introduction and principle of time measurement	1.5	Two principles of time measurement: Reproducibility postulate and dynamic model
Time and relativistic theory	2.5	Impact of special and general relativistic theory on time measurement
Fundamentals of atomic frequency standards	2.5	Atomic states, its energy shifts, high-resolution spectroscopy and high-sensitive detection
Cesium frequency standard and atom interferometer	2.5	Principle of Ramsey resonance and its interpretation as atom interferometer
Specification of frequency standards: evaluation methods and theoritical limit	2	Fundamentals of evaluation of frequency stability with Allan variance, and theoretical limit of frequency stability
noise	2	Incoherent signals and shot noise

【Textbook】

【Textbook(supplemental)】C. Audoin and B. Guinot,The Measurement of Time, (Cambridge University Press, 2001). M. Kitano, Fundamentals of electronic circuits (Reimei publishing, 2009) in Japanese.

【Prerequisite(s)】Fundamentals of physics (quantum physics, in particular) and electric circuits including linear system.
The level which average graduate students of electric and electronic science and technology acquire is sufficient.

【Web Sites】https://www.kogaku.kyoto-u.ac.jp/lecturenotes/

【Additional Information】

10C851

Electrical Conduction in Condensed Matter

電気伝導

【Code】10C851 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Wed 2nd

【Location】Electrical Engineering Bldg.-Lecture Room (M) 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	4	
	2	
	3	
	3	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C834

High Performance Thin Film Engineering

高機能薄膜工学

【Code】10C834 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Tue 1st

【Location】A1-001 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2-3	
	2	
	2-3	
	5-6	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E201

LSI devices

ＬＳＩデバイス論

【Code】10E201 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Mon 3rd

【Location】A1-131 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	3	
	3	
	3	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K010

Recent Advances in Electrical and Electronic Engineering

先端電気電子工学通論

【Code】10K010 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Tuesday, 5

【Location】Laboratories 【Credits】2 【Restriction】Foreig students 【Lecture Form(s)】Seminar

【Language】English 【Instructor】

【Course Description】The class consists of a series of seminars at 3 laboratories related to Department of Electrical and Electronic Engineering (energy and electrical machinery, computers, control and systems, communications and radio engineering, and electronic devices and applied physics). Each seminar intends to give a brief introduction into a specific research field so that students can get a feel for the state-of-the-art in each topic and broaden their scope beyond their majors.

【Grading】The evaluation of a student’s work is given based on his/her attendance, reports and discussions, not on examinations.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693631

Integrated Circuits Engineering, Advanced.

集積回路工学特論

【Code】693631 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Wed 4th

【Location】Electrical Engineering Bldg.-Lecture Room (M) etc. 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R804

Seminar on Creation of New Industries

新産業創成論

【Code】10R804 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 5th

【Location】VBL Seminar Room 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	2	
	1	
	2	
	4	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R807

Seminar on Advanced Electronic Materials

先端電子材料学

【Code】10R807 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 5th 【Location】A1-001 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	1	
	1	
	1	
	1	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10X001

Prospects of Interdisciplinary Photonics and Electronics

融合光･電子科学の展望

【Code】10X001 【Course Year】 【Term】1st term 【Class day & Period】Fri 2nd 【Location】A1-131

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C846

Advanced Seminar in Electronic Science and Engineering I

電子工学特別研修１(インターン)

【Code】10C846 【Course Year】Master Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C848

Advanced Seminar in Electronic Science and Engineering II

電子工学特別研修２(インターン)

【Code】10C848 【Course Year】Master Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C821

Research Internship(M)

研究インターンシップ M

【Code】10C821【Course Year】【Term】1st+2nd term【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R823

Research Internship(M,D)

研究インターンシップ D

【Code】10R823【Course Year】【Term】1st+2nd term【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R825

Advanced Exercises on Electronic Science and Engineering I, II

電子工学特別演習 1

【Code】10R825【Course Year】【Term】1st+2nd term【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10R827

Advanced Exercises on Electronic Science and Engineering I, II

電子工学特別演習 2

【Code】10R827【Course Year】【Term】1st+2nd term【Class day & Period】【Location】【Credits】【Restriction】

【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D051

Frontiers in Modern Science & Technology

現代科学技術の巨人セミナー「知のひらめき」

【Code】10D051 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 5th

【Location】Katsura Hall 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D040

Exercise in Practical Scientific English

実践的科学英語演習「留学ノススメ」

【Code】10D040 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】Seminar 【Language】English 【Instructor】Kenji Wada. etc

【Course Description】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Grading】Attendance 60%, midterm reports 20%, final report 20%. The final report must be submitted by the deadline date.

【Course Goals】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Course Guidance, etc.
Exercise-1	1	Definition of technical writing 3C in technical writing Weaknesses of Japanese writers Good examples and bad examples
Exercise-2	1	Punctuation Presentation skills 1 -organization
Exercise-3	1	Organizing your thoughts for the title and abstract Presentation skills 2 ?Visual aspects
Exercise-4	1	Presenting the background of your research Presentation skills 3 ?Oral Aspects
Exercise-5	1	Describing how you did your research Presentation skills 4 ?Physical Aspects
Exercise-6	1	Presenting what you observed Presentation Practice
Exercise-7	1	Placing your findings in the field Presentation Practice
Exercise-8	1	Expressing thanks and listing references Presentation practice
Exercise-9	1	Writing your proposal Presentation practice
Exercise-10	1	Presentation practice Reviews & Feedbacks Evaluation
Wrap-up lecture	1~2	Current situation of studying abraod, etc.

【Textbook】No textbook is required.

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.ehcc.kyoto-u.ac.jp/alc/ (needs passwords).

【Additional Information】For details, contact Dr. Wada (wadaken@scl.kyoto-u.ac.jp).

10K001

Introduction to Advanced Material Science and Technology

先端マテリアルサイエンス通論

【Code】10K001

【Course Year】Special Auditors, Special research Students, Graduate School Students (inc. International Course Students)

【Term】1st term

【Class day & Period】Starting from April 15, the lecture will be held from 2:45 p.m. to 4:15 p.m. on Friday afternoon but some lectures are from 4:30 p.m.

【Location】Distance lectures are held between Lecture Room 1 in Engineering Bld. 8 at Yoshida campus and Seminar Room 131 in Bld. A1 at Katsura campus. Attend either of them at your convenience.

【Credits】2 【Restriction】 【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】The various technologies used in the field of material science serve as bases for so-called "high technologies", and, in turn, the high technologies develop material science. These relate to each other very closely and contribute to the development of modern industries. In this class, recent progresses in material science are briefly introduced, along with selected current topics on new biomaterials, nuclear engineering materials, new metal materials and natural raw materials. The methods of material analysis and future developments in material science are also discussed.

【Grading】In order to obtain two credits, students must attend at least ten lectures, and at least five of the submitted reports must be evaluated as “passed” by each lecturer. Each report should be submitted to the lecturer within two weeks after his/her lecture. NOTE: Reports are NOT acceptable from those who do not attend the lecture.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	15	

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C829

Quantum Optics

量子光学

【Code】10C829 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Tue 2nd 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	3	
	3	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D001

Chemistry of Inorganic Materials

無機材料化学

【Code】10D001 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 2nd

【Location】A2-302 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	5	
	6	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D004

Chemistry of Organic Materials

有機材料化学

【Code】10D004 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 1st

【Location】A2-302 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Matsubara, Shimizu

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	2	
	2	
	2	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D007

Chemistry of Polymer Materials

高分子材料化学

【Code】10D007 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Fri 2nd

【Location】A2-302 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	4	
	3	
	7	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D010

Chemistry of Functional Materials

機能材料化学

【Code】10D010 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Wed 1st 【Location】A2-307 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D013

Chemistry and Structure of Inorganic Compounds

無機構造化学

【Code】10D013 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Fri 2nd

【Location】A2-302 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	4	
	3	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D022

Chemistry of Organic Natural Products

有機天然物化学

【Code】10D022 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Fri 1st

【Location】A2-302 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Shimizu, Nakao

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	4	
	9	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D031

Chemistry of Biomaterials

生体材料化学

【Code】10D031 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Tue 2nd 【Location】A2-302 【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D034

Analysis and Characterization of Materials Ⅱ

材料解析化学 II

【Code】10D034 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Wed 2nd 【Location】A2-302 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	5	
	5	
	4	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D037

Laboratory and Exercise in Material Chemistry

材料化学特別実験及演習

【Code】10D037 【Course Year】Master 2nd 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】8 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K001

Introduction to Advanced Material Science and Technology

先端マテリアルサイエンス通論

【Code】10K001

【Course Year】Special Auditors, Special research Students, Graduate School Students (inc. International Course Students)

【Term】1st term

【Class day & Period】Starting from April 15, the lecture will be held from 2:45 p.m. to 4:15 p.m. on Friday afternoon but some lectures are from 4:30 p.m.

【Location】Distance lectures are held between Lecture Room 1 in Engineering Bld. 8 at Yoshida campus and Seminar Room 131 in Bld. A1 at Katsura campus. Attend either of them at your convenience.

【Credits】2 【Restriction】 【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】The various technologies used in the field of material science serve as bases for so-called "high technologies", and, in turn, the high technologies develop material science. These relate to each other very closely and contribute to the development of modern industries. In this class, recent progresses in material science are briefly introduced, along with selected current topics on new biomaterials, nuclear engineering materials, new metal materials and natural raw materials. The methods of material analysis and future developments in material science are also discussed.

【Grading】In order to obtain two credits, students must attend at least ten lectures, and at least five of the submitted reports must be evaluated as “passed” by each lecturer. Each report should be submitted to the lecturer within two weeks after his/her lecture. NOTE: Reports are NOT acceptable from those who do not attend the lecture.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	15	

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K004

New Engineering Materials, Adv.

新工業素材特論

【Code】10K004 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 5th

【Location】(Katsura)A1-131 (Yoshida)Lecture Room3,Reseach Bldg.No.4 【Credits】2 【Restriction】

【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	Composite Materials: Smart, Lightweight and Strong Materials (HOJO)
	1	Innovations in High Performance Steels for Bridge Construction (SUGIURA)
	1	Materials in Micro Electro Mechanical Systems (MEMS) (TSUCHIYA)
	1	High Temperature Superconductivity and Its Application to Electronics(SUZUKI)
	1	Sustainability Issues(SHIMIZU)
	1	Material Properties of Fiber Reinforced Cementitious Composites and Applicability to Structures (KANEKO)
	1	Structural biochemistry of proteins (SHIRAKAWA)
	2	Semiconductor Materials and Devices (KIMOTO)
	1	Separation Analysis in Micro- and Nano-scale (OTSUKA)
	1	Polymer Synthesis beyond the 21st Century:Precision Polymerizations and Novel Polymeric Materials (SAWAMOTO)
	1	Inorganic New Materials (EGUCHI)

【Textbook】

【Textbook(supplemental)】Class handouts

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D040

Exercise in Practical Scientific English

実践的科学英語演習「留学ノススメ」

【Code】10D040 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】Seminar 【Language】English 【Instructor】Kenji Wada. etc

【Course Description】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Grading】Attendance 60%, midterm reports 20%, final report 20%. The final report must be submitted by the deadline date.

【Course Goals】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Course Guidance, etc.
Exercise-1	1	Definition of technical writing 3C in technical writing Weaknesses of Japanese writers Good examples and bad examples
Exercise-2	1	Punctuation Presentation skills 1 -organization
Exercise-3	1	Organizing your thoughts for the title and abstract Presentation skills 2 ?Visual aspects
Exercise-4	1	Presenting the background of your research Presentation skills 3 ?Oral Aspects
Exercise-5	1	Describing how you did your research Presentation skills 4 ?Physical Aspects
Exercise-6	1	Presenting what you observed Presentation Practice
Exercise-7	1	Placing your findings in the field Presentation Practice
Exercise-8	1	Expressing thanks and listing references Presentation practice
Exercise-9	1	Writing your proposal Presentation practice
Exercise-10	1	Presentation practice Reviews & Feedbacks Evaluation
Wrap-up lecture	1~2	Current situation of studying abraod, etc.

【Textbook】No textbook is required.

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.ehcc.kyoto-u.ac.jp/alc/ (needs passwords).

【Additional Information】For details, contact Dr. Wada (wadaken@scl.kyoto-u.ac.jp).

10D043

Instrumental Analysis, Adv. I

先端科学機器分析及び実習 I

【Code】10D043 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】

【Location】A2-304 【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D046

Instrumental Analysis, Adv. II

先端科学機器分析及び実習 II

【Code】10D046 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】

【Location】A2-304 【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D051

Frontiers in Modern Science & Technology

現代科学技術の巨人セミナー「知のひらめき」

【Code】10D051 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 5th

【Location】Katsura Hall 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D055

Material Chemistry Adv. I

材料化学特論第一

【Code】10D055 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C296

Integrated Materials Science IV

統合材料科学IV

【Code】10C296 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 3rd

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C294

Integrated Molecular Science IV

統合物質科学IV

【Code】10C294 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】Faculty of Science Bldg.No.6 Room402 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Relay Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S002

Design of Functional Materials,Advanced

機能材料設計学特論

【Code】10S002 【Course Year】Master Course 【Term】1st term 【Class day & Period】Thu 3rd

【Location】A2-122 【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S003

Inorganic Structural Chemistry,Advanced

無機構造化学特論

【Code】10S003 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Mon 4th

【Location】A2-302 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S006

Industrial Solid-State Chemistry,Advanced

応用固体化学特論

【Code】10S006 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Mon 5th

【Location】A2-302 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	6	
	6	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S010

Organic Reaction Chemistry,Advanced

有機反応化学特論

【Code】10S010 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Wed 4th

【Location】A2-302 【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S013

Organic Chemistry of Natural Products, Advanced

天然物有機化学特論

【Code】10S013 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Wed 5th

【Location】A2-302 【Credits】2 【Restriction】 【Lecture Form(s)】Seminar 【Language】Japanese

【Instructor】Shimizu, Nakao

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S016

Analytical Chemistry of Materials, Advanced

材料解析化学特論

【Code】10S016 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Wed 4th

【Location】A2-122 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S019

Physical Properties of Polymer Materials,Advanced

高分子材料物性特論

【Code】10S019 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Tue 5th

【Location】A2-302 【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S022

Synthesis of Polymer Materials,Advanced

高分子材料合成特論

【Code】10S022 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Tue 5th

【Location】A2-302 【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D016

Synthetic Chemistry of Inorganic Solids

固体合成化学

【Code】10D016 【Course Year】Master and Doctor Course 【Term】(not held; biennially) 【Class day & Period】

【Location】 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	4	
	3	
	5	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D019

Synthesis of Organic Materials

有機材料合成化学

【Code】10D019 【Course Year】Master and Doctor Course 【Term】(not held; biennially) 【Class day & Period】

【Location】 【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	3	
	3	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D025

Analysis and Characterization of Materials

材料解析化学

【Code】10D025 【Course Year】Master and Doctor Course 【Term】(not held; biennially)

【Class day & Period】Wed 1st 【Location】A2-302 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	5	
	5	
	4	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D028

Polymer Physics and Function

高分子機能物性

【Code】10D028 【Course Year】Master and Doctor Course 【Term】(not held; biennially) 【Class day & Period】

【Location】 【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	5	
	3	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D057

Material Chemistry Adv. II

材料化学特論第二

【Code】10D057 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S202

Green and Sustainable Chemistry

物質環境化学

【Code】10S202 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 2nd 【Location】A2-303 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】K.Ohe,Y.Tsuji,T.Kakiuchi

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	1	
	1	
	1	
	2	
	1	
	1	
	1	
	2	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D205

Inorganic Solid-State Chemistry

無機固体化学

【Code】10D205 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Thu 2nd 【Location】A2-303 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】H.Kageyama

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	6	
	6	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D201

Electrochemistry Advanced

電気化学特論

【Code】10D201 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 1st

【Location】A2-303 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】T.Abe

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	5	
	2	
	3	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D216

Functional Solution Chemistry

機能性溶液化学

【Code】10D216 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 2nd 【Location】A2-303 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】T.Kakiuchi

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D213

Catalysis in Organic Reactions

有機触媒化学

【Code】10D213 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 1st

【Location】A2-303 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】K.Ohe

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	1	
	2	
	2	
	2	
	1	
	1	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D218

Design of Solid Catalysts

固体触媒設計学

【Code】10D218 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 2nd 【Location】A2-303 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】K.Eguchi

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	2	
	2	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D219

Structural Organic Chemistry

構造有機化学

【Code】10D219 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Tue 2nd 【Location】A2-303 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Y.Murata

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	1	
	1	
	3	
	3	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D238

Radiochemistry, Adv.

放射化学特論

【Code】10D238 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Fri 2nd

【Location】A2-303 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】S.Shibata

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	2	
	2	
	2	
	2	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D228

Energy and Hydrocarbon Chemistry, Adv. I

物質エネルギー化学特論第一

【Code】10D228 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】A2-303 【Credits】1 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】A.Wakamiya

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D229

Energy and Hydrocarbon Chemistry, Adv. II

物質エネルギー化学特論第二

【Code】10D229 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】A2-303 【Credits】1 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】T.Fukutsuka

【Course Description】In this course, synthesis methods of thin films and application to enegry-conversion devices are introduced.

【Grading】Attendance and term paper

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Sythesis of thin film	3	
Application of thin film	4	

【Textbook】Handout will be circulated.

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D232

Energy and Hydrocarbon Chemistry, Adv. V

物質エネルギー化学特論第五

【Code】10D232 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】A2-306

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】H.Masuda

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D235

Energy and Hydrocarbon Chemistry, Adv. VII

物質エネルギー化学特論第七

【Code】10D235 【Course Year】Master Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】1 【Restriction】No Restriction 【Lecture Form(s)】Intensive Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D236

Energy and Hydrocarbon Chemistry, Adv. VIII

物質エネルギー化学特論第八

【Code】10D236 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】A2-306

【Credits】1 【Restriction】No Restriction 【Lecture Form(s)】Intensive Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K001

Introduction to Advanced Material Science and Technology

先端マテリアルサイエンス通論

【Code】10K001

【Course Year】Special Auditors, Special research Students, Graduate School Students (inc. International Course Students)

【Term】1st term

【Class day & Period】Starting from April 15, the lecture will be held from 2:45 p.m. to 4:15 p.m. on Friday afternoon but some lectures are from 4:30 p.m.

【Location】Distance lectures are held between Lecture Room 1 in Engineering Bld. 8 at Yoshida campus and Seminar Room 131 in Bld. A1 at Katsura campus. Attend either of them at your convenience.

【Credits】2 【Restriction】 【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】The various technologies used in the field of material science serve as bases for so-called "high technologies", and, in turn, the high technologies develop material science. These relate to each other very closely and contribute to the development of modern industries. In this class, recent progresses in material science are briefly introduced, along with selected current topics on new biomaterials, nuclear engineering materials, new metal materials and natural raw materials. The methods of material analysis and future developments in material science are also discussed.

【Grading】In order to obtain two credits, students must attend at least ten lectures, and at least five of the submitted reports must be evaluated as “passed” by each lecturer. Each report should be submitted to the lecturer within two weeks after his/her lecture. NOTE: Reports are NOT acceptable from those who do not attend the lecture.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	15	

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K004

New Engineering Materials, Adv.

新工業素材特論

【Code】10K004 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 5th

【Location】(Katsura)A1-131 (Yoshida)Lecture Room3,Reseach Bldg.No.4 【Credits】2 【Restriction】

【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	Composite Materials: Smart, Lightweight and Strong Materials (HOJO)
	1	Innovations in High Performance Steels for Bridge Construction (SUGIURA)
	1	Materials in Micro Electro Mechanical Systems (MEMS) (TSUCHIYA)
	1	High Temperature Superconductivity and Its Application to Electronics(SUZUKI)
	1	Sustainability Issues(SHIMIZU)
	1	Material Properties of Fiber Reinforced Cementitious Composites and Applicability to Structures (KANEKO)
	1	Structural biochemistry of proteins (SHIRAKAWA)
	2	Semiconductor Materials and Devices (KIMOTO)
	1	Separation Analysis in Micro- and Nano-scale (OTSUKA)
	1	Polymer Synthesis beyond the 21st Century:Precision Polymerizations and Novel Polymeric Materials (SAWAMOTO)
	1	Inorganic New Materials (EGUCHI)

【Textbook】

【Textbook(supplemental)】Class handouts

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D043

Instrumental Analysis, Adv. I

先端科学機器分析及び実習 I

【Code】10D043 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】

【Location】A2-304 【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D046

Instrumental Analysis, Adv. II

先端科学機器分析及び実習 II

【Code】10D046 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】

【Location】A2-304 【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D051

Frontiers in Modern Science & Technology

現代科学技術の巨人セミナー「知のひらめき」

【Code】10D051 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 5th

【Location】Katsura Hall 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D040

Exercise in Practical Scientific English

実践的科学英語演習「留学ノススメ」

【Code】10D040 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】Seminar 【Language】English 【Instructor】Kenji Wada. etc

【Course Description】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Grading】Attendance 60%, midterm reports 20%, final report 20%. The final report must be submitted by the deadline date.

【Course Goals】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Course Guidance, etc.
Exercise-1	1	Definition of technical writing 3C in technical writing Weaknesses of Japanese writers Good examples and bad examples
Exercise-2	1	Punctuation Presentation skills 1 -organization
Exercise-3	1	Organizing your thoughts for the title and abstract Presentation skills 2 ?Visual aspects
Exercise-4	1	Presenting the background of your research Presentation skills 3 ?Oral Aspects
Exercise-5	1	Describing how you did your research Presentation skills 4 ?Physical Aspects
Exercise-6	1	Presenting what you observed Presentation Practice
Exercise-7	1	Placing your findings in the field Presentation Practice
Exercise-8	1	Expressing thanks and listing references Presentation practice
Exercise-9	1	Writing your proposal Presentation practice
Exercise-10	1	Presentation practice Reviews & Feedbacks Evaluation
Wrap-up lecture	1~2	Current situation of studying abraod, etc.

【Textbook】No textbook is required.

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.ehcc.kyoto-u.ac.jp/alc/ (needs passwords).

【Additional Information】For details, contact Dr. Wada (wadaken@scl.kyoto-u.ac.jp).

10C294

Integrated Molecular Science IV

統合物質科学IV

【Code】10C294 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】Faculty of Science Bldg.No.6 Room402 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Relay Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C296

Integrated Materials Science IV

統合材料科学IV

【Code】10C296 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 3rd

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D234

Experiments & Exercises in Energy and Hydrocarbon Chemistry, Adv.

物質エネルギー化学特別実験及演習

【Code】10D234 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】8 【Restriction】No Restriction 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S204

Energy and Hydrocarbon Chemistry Special Seminar 1

物質エネルギー化学特別セミナー１

【Code】10S204 【Course Year】Doctor 1st 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S205

Energy and Hydrocarbon Chemistry Special Seminar 2

物質エネルギー化学特別セミナー２

【Code】10S205 【Course Year】Doctor 2nd 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S206

Energy and Hydrocarbon Chemistry Special Seminar 3

物質エネルギー化学特別セミナー３

【Code】10S206 【Course Year】Doctor 2nd 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D041

Organotransition Metal Chemistry 1

有機金属化学 1

【Code】10D041 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	2	
	1	
	2	
	3	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D042

Organotransition Metal Chemistry 2

有機金属化学２

【Code】10D042 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Fri 1st

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D818

Advanced Organic Chemistry

先端有機化学

【Code】10D818 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 1st

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S201

Energy Conversion Reactions

エネルギー変換反応論

【Code】10S201 【Course Year】Master and Doctor Course 【Term】 【Class day & Period】

【Location】A2-303 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】K.Eguchi,T.Abe,H.Kageyama

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D207

Excited-State Hydrocarbon Chemistry

励起物質化学

【Code】10D207 【Course Year】Master and Doctor Course 【Term】 【Class day & Period】

【Location】A2-303 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】S.Nishimoto

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	2	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D217

Chemical Conversion of Carbon Resources

資源変換化学

【Code】10D217 【Course Year】Master Course 【Term】 【Class day & Period】 【Location】A2-303

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】M.Inoue

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	1	
	1	
	3	
	1	
	1	
	3	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D210

Chemistry of Organometallic Complexes

有機錯体化学

【Code】10D210 【Course Year】Master and Doctor Course 【Term】 【Class day & Period】 【Location】A2-303 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese 【Instructor】Tsuji,Terao

【Course Description】Basic organometallic chemistry including history, structure, bonding, reactions, and survey of various metal complexes is lectured. Several typical catalytic reactions are explicated on the basis of elementary steps in organometallic chemistry such as ligand substitution, oxidative addition, reductive elimination, and insertion reactions.

【Grading】Graded by written examination

【Course Goals】Acquirement of basic idea of:

1. General properties of transition metal organometallic complexes
2. Reactivity of transition metal organometallic compounds
3. Homogeneous catalysis of practical importance
4. Recent research trends in homogeneous catalysis

【Course Topics】

Theme	Class number of times	Description
Introduction	1	History Application Research trends Zaise salt Grignard reagent Alkyl lithium Ferrocene
General properties of transition metal organometallic complexes (1)	1	Ziegler catalyst Hydroboration Wittig reaction Serendipity
General properties of transition metal organometallic complexes (2)	1	Bonding Structure in general Coordination number η -Structure μ -Structure
General properties of transition metal organometallic complexes (3)	1	Number of d- and s-electrons Classification and the nature of ligands Effect of complexation Formal charge Electron counting 18-electron rule Oxidation state
Reactivity of transition metal organometallic compounds (1)	1	Oxidative addition Reductive elimination
Reactivity of transition metal organometallic compounds (2)	1	Insertion reaction Direct attack to the ligand Other reactivities
Homogeneous catalysis (1)	1	Monsanto's acetic acid process Hydroformylation Hydrosilylation Hydrocyanation Polymerization
Homogeneous catalysis (2)	1	Wacker process Various cross-coupling reaction Mizoroki-Heck reaction
Recent research trends in homogeneous catalysis (1)	1	C-H and C-C bond activation
Recent research trends in homogeneous catalysis (2)	1	Asymetric catalysis
Organometallics in materials science (1)	1	Strucural metarials
Organometallics in materials science (2)	1	Electronic and optoelectronic applications

【Textbook】No textbooks are used.

【Textbook(supplemental)】R.H.Crabtree,The Organometallic Chemistry of the Transition MetalsFourth Edition;Wiley-Interscience:Hoboken,2005.

【Prerequisite(s)】Basic knowledge in organic chemistry, physical chemistry, and inorganic chemistry is requisite.

【Web Sites】

【Additional Information】

10D222

Material Transformation Chemistry

物質変換化学

【Code】10D222 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 2nd

【Location】A2-303 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】M.Nakamura, H.Takaya

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】This course is not provided in the academic year of 2011. The details of the course topics, etc., will be informed in 2012.

10D226

Chemistry of Well-Defined Catalysts

錯体触媒設計学

【Code】10D226 【Course Year】Master and Doctor Course 【Term】 【Class day & Period】

【Location】A2-303 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】F.Ozawa

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	1	
	2	
	2	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10V426

Functionalized Nucleic Acids Chemistry

機能性核酸化学

【Code】10V426 【Course Year】Master and Doctor Course 【Term】 【Class day & Period】

【Location】A2-303 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Nishimoto and Tanabe

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	1	
	2	
	2	
	2	
	2	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D230

Energy and Hydrocarbon Chemistry, Adv. III

物質エネルギー化学特論第三

【Code】10D230 【Course Year】Master Course 【Term】 【Class day & Period】 【Location】A2-303

【Credits】1 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D231

Energy and Hydrocarbon Chemistry, Adv. IV

物質エネルギー化学特論第四

【Code】10D231 【Course Year】Master Course 【Term】 【Class day & Period】 【Location】A2-303

【Credits】1 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D233

Energy and Hydrocarbon Chemistry, Adv. IV

物質エネルギー化学特論第六

【Code】10D233 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D401

Statistical Thermodynamics

統計熱力学

【Code】10D401 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Thu 2nd 【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】K. Tanaka

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	3	
	2	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D405

Quantum Chemistry Ⅰ

量子化学 I

【Code】10D405 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 2nd 【Location】A2-304 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	2	
	1	
	1	
	2	
	2	
	2	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D406

Quantum Chemistry II

量子化学 II

【Code】10D406 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 2nd 【Location】A2-304 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】,

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	3	
	3	
	1	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D408

Molecular Spectroscopy

分子分光学

【Code】10D408 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Wed 2nd

【Location】A2-304 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture

【Language】Japanese 【Instructor】

【Course Description】Lectures on NMR, UV-vis and IR, and X-ray spectroscopy

【Grading】Evaluated based on examination scores

【Course Goals】To learn basic concepts and operations of NMR, UV-vis and IR, and X-ray spectroscopy

【Course Topics】

Theme	Class number of times	Description
NMR spectroscopy	4	
UV-vis and IR spectroscopy	4	
X-ray spectroscopy	4	
practice	2	

【Textbook】Non

【Textbook(supplemental)】Malcolm H. Levitt "Spin Dynamics: Basics of Nuclear Magnetic Resonance (2nd Edition)" Wiley (for NMR)

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D416

Catalysis Science at Molecular Level

分子触媒学

【Code】10D416 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Fri 2nd

【Location】A2-304 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	2	
	1	
	2	
	1	
	2	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D422

Molecular Materials Science

分子材料科学

【Code】10D422 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 2nd

【Location】2F Seminar Room, Training Center for Industrial Instructors, Uji Campus 【Credits】2

【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Kaji

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	3	
	2	
	2	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D425

Molecular Inorganic Materials Science

分子無機材料

【Code】10D425 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 3rd 【Location】 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】,

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	2	
	2	
	2	
	2	
	2	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D428

Molecular Rheology

分子レオロジー

【Code】10D428 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 1st

【Location】A2-304 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】H. Watanabe & Y. Masubuchi

【Course Description】Lecture is given for the rheology and dynamics of polymeric liquids and their molecular basis.

【Grading】Mainly with report

【Course Goals】Understanding molecular dynamics and rheology of polymers

【Course Topics】

Theme	Class number of times	Description
Rheology basics	2	Rheology and its role in science and engineering, flow / deformation/ stress, viscosity, modulus
Rheological behavior of matter	2	Rheological behavior of matter and classification, viscoelasticity, non-Newtonian flow, plastic flow
Viscoelastic relaxations	2	Boltzmann's principle, relaxation functions, relaxation time, conversion among response functions, complex modulus
Viscoelasticity and temperature	1	Glass transition, time-temperature superposition rule, WLF equation
Stress expression of polymers	2	Stress expression, tension / free-energy / distribution-function of subchains
Rouse model	1	Model description, model equation, derivation of stress and relaxation modulus, discussion on the relaxation behavior
Zimm model	1	Model description, model equation, derivation of stress and relaxation modulus, discussion on the relaxation behavior, comparison to Rouse dynamics
reptation model	2	Model description, model equation, derivation of stress and relaxation modulus, discussion on the relaxation behavior, comparison to Rouse dynamics
advanced reptation models	2	Contour Length Fluctuation, Constraint Release, Convective Constraint Release, slip-link model, pom-pom model

【Textbook】Original text will be distributed in the class

【Textbook(supplemental)】M Doi & S F Edwards The Theory of Polymer Dynamics Oxford press W Graessley Polymeric Liquids & Networks: Dynamics and Rheology Garland Science

【Prerequisite(s)】Some basics on differential equations and statistical physics of polymers

【Web Sites】http://rheology.minority.jp

【Additional Information】

10D432

Laboratory and Exercises in Molecular Engineering I

分子工学特別実験及演習Ⅰ

【Code】10D432 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D433

Laboratory and Exercises in Molecular Engineering ＩＩ

分子工学特別実験及演習 II

【Code】10D433 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D434

Molecular Engineering, Adv. Ⅰ

分子工学特論第一

【Code】10D434 【Course Year】Master Course 【Term】not held 【Class day & Period】 【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D435

Molecular Engineering, Adv. II

分子工学特論第二

【Code】10D435 【Course Year】Master Course 【Term】not held 【Class day & Period】 【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D436

Molecular Engineering, Adv. III

分子工学特論第三

【Code】10D436 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D437

Molecular Engineering, Adv. Ⅳ

分子工学特論第四

【Code】10D437 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K001

Introduction to Advanced Material Science and Technology

先端マテリアルサイエンス通論

【Code】10K001

【Course Year】Special Auditors, Special research Students, Graduate School Students (inc. International Course Students)

【Term】1st term

【Class day & Period】Starting from April 15, the lecture will be held from 2:45 p.m. to 4:15 p.m. on Friday afternoon but some lectures are from 4:30 p.m.

【Location】Distance lectures are held between Lecture Room 1 in Engineering Bld. 8 at Yoshida campus and Seminar Room 131 in Bld. A1 at Katsura campus. Attend either of them at your convenience.

【Credits】2 【Restriction】 【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】The various technologies used in the field of material science serve as bases for so-called "high technologies", and, in turn, the high technologies develop material science. These relate to each other very closely and contribute to the development of modern industries. In this class, recent progresses in material science are briefly introduced, along with selected current topics on new biomaterials, nuclear engineering materials, new metal materials and natural raw materials. The methods of material analysis and future developments in material science are also discussed.

【Grading】In order to obtain two credits, students must attend at least ten lectures, and at least five of the submitted reports must be evaluated as “passed” by each lecturer. Each report should be submitted to the lecturer within two weeks after his/her lecture. NOTE: Reports are NOT acceptable from those who do not attend the lecture.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	15	

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K004

New Engineering Materials, Adv.

新工業素材特論

【Code】10K004 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 5th

【Location】(Katsura)A1-131 (Yoshida)Lecture Room3,Reseach Bldg.No.4 【Credits】2 【Restriction】

【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	Composite Materials: Smart, Lightweight and Strong Materials (HOJO)
	1	Innovations in High Performance Steels for Bridge Construction (SUGIURA)
	1	Materials in Micro Electro Mechanical Systems (MEMS) (TSUCHIYA)
	1	High Temperature Superconductivity and Its Application to Electronics(SUZUKI)
	1	Sustainability Issues(SHIMIZU)
	1	Material Properties of Fiber Reinforced Cementitious Composites and Applicability to Structures (KANEKO)
	1	Structural biochemistry of proteins (SHIRAKAWA)
	2	Semiconductor Materials and Devices (KIMOTO)
	1	Separation Analysis in Micro- and Nano-scale (OTSUKA)
	1	Polymer Synthesis beyond the 21st Century:Precision Polymerizations and Novel Polymeric Materials (SAWAMOTO)
	1	Inorganic New Materials (EGUCHI)

【Textbook】

【Textbook(supplemental)】Class handouts

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D040

Exercise in Practical Scientific English

実践的科学英語演習「留学ノススメ」

【Code】10D040 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】Seminar 【Language】English 【Instructor】Kenji Wada. etc

【Course Description】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Grading】Attendance 60%, midterm reports 20%, final report 20%. The final report must be submitted by the deadline date.

【Course Goals】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Course Guidance, etc.
Exercise-1	1	Definition of technical writing 3C in technical writing Weaknesses of Japanese writers Good examples and bad examples
Exercise-2	1	Punctuation Presentation skills 1 -organization
Exercise-3	1	Organizing your thoughts for the title and abstract Presentation skills 2 ?Visual aspects
Exercise-4	1	Presenting the background of your research Presentation skills 3 ?Oral Aspects
Exercise-5	1	Describing how you did your research Presentation skills 4 ?Physical Aspects
Exercise-6	1	Presenting what you observed Presentation Practice
Exercise-7	1	Placing your findings in the field Presentation Practice
Exercise-8	1	Expressing thanks and listing references Presentation practice
Exercise-9	1	Writing your proposal Presentation practice
Exercise-10	1	Presentation practice Reviews & Feedbacks Evaluation
Wrap-up lecture	1~2	Current situation of studying abraod, etc.

【Textbook】No textbook is required.

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.ehcc.kyoto-u.ac.jp/alc/ (needs passwords).

【Additional Information】For details, contact Dr. Wada (wadaken@scl.kyoto-u.ac.jp).

10D043

Instrumental Analysis, Adv. I

先端科学機器分析及び実習 I

【Code】10D043 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】

【Location】A2-304 【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D046

Instrumental Analysis, Adv. II

先端科学機器分析及び実習 II

【Code】10D046 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】

【Location】A2-304 【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D051

Frontiers in Modern Science & Technology

現代科学技術の巨人セミナー「知のひらめき」

【Code】10D051 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 5th

【Location】Katsura Hall 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C296

Integrated Materials Science IV

統合材料科学IV

【Code】10C296 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 3rd

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C294

Integrated Molecular Science IV

統合物質科学IV

【Code】10C294 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】Faculty of Science Bldg.No.6 Room402 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Relay Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S401

Advanced Molecular Engineering

分子工学特論

【Code】10S401 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S404

Advanced Seminar on Molecular Engineering 1

分子工学特別セミナー１

【Code】10S404 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S405

Advanced Seminar on Molecular Engineering 2

分子工学特別セミナー２

【Code】10S405 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D448

Biomolecular Function Chemistry

生体分子機能化学

【Code】10D448 【Course Year】Master and Doctor Course 【Term】(not held; biennially) 【Class day & Period】

【Location】 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D413

Molecular Materials

分子機能材料

【Code】10D413 【Course Year】Master and Doctor Course 【Term】(not held; biennially)

【Class day & Period】Wed 2nd 【Location】A2-304 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】K. Tanaka and A. Ito

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	11	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D417

Molecular Photochemistry

分子光化学

【Code】10D417 【Course Year】Master and Doctor Course 【Term】(not held; biennially)

【Class day & Period】Mon 2nd 【Location】A2-304 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D419

Molecular Reaction Dynamics

分子反応動力学

【Code】10D419 【Course Year】Master and Doctor Course 【Term】(not held; biennially)

【Class day & Period】Fri 2nd 【Location】A2-304 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	3	
	3	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D649

Polymer Synthesis

高分子合成

【Code】10D649 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】A2-307 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D651

Polymer Physical Properties

高分子物性

【Code】10D651 【Course Year】Master Course 【Term】1st term 【Class day & Period】Thu 2nd

【Location】A2-307 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	3	
	4	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S604

Advanced Seminar on Polymer Chemistry 1

高分子化学特別セミナー1

【Code】10S604 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S605

Advanced Seminar on Polymer Chemistry ２

高分子化学特別セミナー２

【Code】10S605 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D610

Reactive Polymers

反応性高分子

【Code】10D610 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Wed 2nd

【Location】A2-307 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	3	
	1	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D611

生体機能高分子

【Code】10D611 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 2nd

【Location】A2-307 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D643

Polymer Solution Science

高分子溶液学

【Code】10D643 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 2nd

【Location】A2-307 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	3	
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D622

Physical Chemistry of Polymers

高分子基礎物理化学

【Code】10D622 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 2nd

【Location】A2-307 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	2	
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D636

Polymer Design for Biomedical and Pharmaceutical Applications

医薬用高分子設計学

【Code】10D636 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】A2-307 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	1	
	1	
	1	
	3	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D638

Advanced Seminar on Polymer Industry

高分子産業特論

【Code】10D638 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 3rd and 4th

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D640

Polymer Chemistry Laboratory & Exercise

高分子化学特別実験及演習

【Code】10D640 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】8 【Restriction】 【Lecture Form(s)】Experiment and Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K001

Introduction to Advanced Material Science and Technology

先端マテリアルサイエンス通論

【Code】10K001

【Course Year】Special Auditors, Special research Students, Graduate School Students (inc. International Course Students)

【Term】1st term

【Class day & Period】Starting from April 15, the lecture will be held from 2:45 p.m. to 4:15 p.m. on Friday afternoon but some lectures are from 4:30 p.m.

【Location】Distance lectures are held between Lecture Room 1 in Engineering Bld. 8 at Yoshida campus and Seminar Room 131 in Bld. A1 at Katsura campus. Attend either of them at your convenience.

【Credits】2 【Restriction】 【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】The various technologies used in the field of material science serve as bases for so-called "high technologies", and, in turn, the high technologies develop material science. These relate to each other very closely and contribute to the development of modern industries. In this class, recent progresses in material science are briefly introduced, along with selected current topics on new biomaterials, nuclear engineering materials, new metal materials and natural raw materials. The methods of material analysis and future developments in material science are also discussed.

【Grading】In order to obtain two credits, students must attend at least ten lectures, and at least five of the submitted reports must be evaluated as “passed” by each lecturer. Each report should be submitted to the lecturer within two weeks after his/her lecture. NOTE: Reports are NOT acceptable from those who do not attend the lecture.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	15	

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K004

New Engineering Materials, Adv.

新工業素材特論

【Code】10K004 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 5th

【Location】(Katsura)A1-131 (Yoshida)Lecture Room3,Reseach Bldg.No.4 【Credits】2 【Restriction】

【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	Composite Materials: Smart, Lightweight and Strong Materials (HOJO)
	1	Innovations in High Performance Steels for Bridge Construction (SUGIURA)
	1	Materials in Micro Electro Mechanical Systems (MEMS) (TSUCHIYA)
	1	High Temperature Superconductivity and Its Application to Electronics(SUZUKI)
	1	Sustainability Issues(SHIMIZU)
	1	Material Properties of Fiber Reinforced Cementitious Composites and Applicability to Structures (KANEKO)
	1	Structural biochemistry of proteins (SHIRAKAWA)
	2	Semiconductor Materials and Devices (KIMOTO)
	1	Separation Analysis in Micro- and Nano-scale (OTSUKA)
	1	Polymer Synthesis beyond the 21st Century:Precision Polymerizations and Novel Polymeric Materials (SAWAMOTO)
	1	Inorganic New Materials (EGUCHI)

【Textbook】

【Textbook(supplemental)】Class handouts

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C294

Integrated Molecular Science IV

統合物質科学IV

【Code】10C294 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】Faculty of Science Bldg.No.6 Room402 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Relay Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C296

Integrated Materials Science IV

統合材料科学IV

【Code】10C296 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 3rd

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D041

Organotransition Metal Chemistry 1

有機金属化学 1

【Code】10D041 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	2	
	1	
	2	
	3	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D042

Organotransition Metal Chemistry 2

有機金属化学２

【Code】10D042 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Fri 1st

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D818

Advanced Organic Chemistry

先端有機化学

【Code】10D818 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 1st

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D043

Instrumental Analysis, Adv. I

先端科学機器分析及び実習 I

【Code】10D043 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】

【Location】A2-304 【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D046

Instrumental Analysis, Adv. II

先端科学機器分析及び実習 II

【Code】10D046 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】

【Location】A2-304 【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D051

Frontiers in Modern Science & Technology

現代科学技術の巨人セミナー「知のひらめき」

【Code】10D051 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 5th

【Location】Katsura Hall 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D040

Exercise in Practical Scientific English

実践的科学英語演習「留学ノススメ」

【Code】10D040 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】Seminar 【Language】English 【Instructor】Kenji Wada. etc

【Course Description】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Grading】Attendance 60%, midterm reports 20%, final report 20%. The final report must be submitted by the deadline date.

【Course Goals】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Course Guidance, etc.
Exercise-1	1	Definition of technical writing 3C in technical writing Weaknesses of Japanese writers Good examples and bad examples
Exercise-2	1	Punctuation Presentation skills 1 -organization
Exercise-3	1	Organizing your thoughts for the title and abstract Presentation skills 2 ?Visual aspects
Exercise-4	1	Presenting the background of your research Presentation skills 3 ?Oral Aspects
Exercise-5	1	Describing how you did your research Presentation skills 4 ?Physical Aspects
Exercise-6	1	Presenting what you observed Presentation Practice
Exercise-7	1	Placing your findings in the field Presentation Practice
Exercise-8	1	Expressing thanks and listing references Presentation practice
Exercise-9	1	Writing your proposal Presentation practice
Exercise-10	1	Presentation practice Reviews & Feedbacks Evaluation
Wrap-up lecture	1~2	Current situation of studying abraod, etc.

【Textbook】No textbook is required.

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.ehcc.kyoto-u.ac.jp/alc/ (needs passwords).

【Additional Information】For details, contact Dr. Wada (wadaken@scl.kyoto-u.ac.jp).

10D645

Polymer Functional Chemistry

高分子機能化学

【Code】10D645 【Course Year】Master Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D607

Design of Polymerization Reactions

高分子生成論

【Code】10D607 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Mitsuo Sawamoto and Makoto Ouchi

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	3	
	3	
	5	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D613

Polymer Structure and Function

高分子機能学

【Code】10D613 【Course Year】Master Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】Polymers are indispensable in our modern society, fundamental in industry, and functional for chemistry, medicine, electronics, and many other advanced and emerging technologies. In this class, photo- and electric functions of polymeric materials are discussed on the basis of photochemistry and photophysics. In particular, the importance of designing nanostructures of polymer assembly is highlighted by explaining examples of state-of-the-art real systems.

【Grading】Evaluated with the grade on the final test or the quality of report submitted after the final class.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Introduction	1	
Photofunctional Polymers	5	
Dielectric Functions of Polymers	1	
Electronic Functions of Polymers	5	
Advanced Functionality of Polymer Films	2	

【Textbook】None: Some handouts will be dealt in the class of every lecture.

【Textbook(supplemental)】None:

【Prerequisite(s)】Students are expected to have knowledge of Physical Chemistry and Polymer Chemistry provided in chemisty course of undergraduate.

【Web Sites】

【Additional Information】

10D616

Polymer Supermolecular Structure

高分子集合体構造

【Code】10D616 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English

【Instructor】Hirokazu Hasegawa

【Course Description】Polymers self-assemble by intra- and/or intermolecular interaction to form assembled structures of polymer molecules. Such structures are closely related to the properties of the polymeric materials, it is necessary to control the assembled structures of the constituent polymer molecules in order to control the properties of polymeric materials, especially solid materials. In this lecture particularly, formation mechanisms, analytical techniques, and elucidated structures of crystalline and liquid-crystalline polymers, phase-separated structures of polymer mixtures, microphase-separated structures of block and graft copolymers will be discussed.

【Grading】The grading is based on the report assignments.

【Course Goals】This course aims for the development of the faculty to infer the properties of polymeric materials from their morphology based on the knowledge of structure-property relationships of higher-order structures of crystalline and liquid-crystalline polymers, phase-separated structures of polymer mixtures (blends), microdomain stuctures of block copolymers, etc.

【Course Topics】

Theme	Class number of times	Description
Crystalline Polymers	3	In the lectures, unit cell structures and hierarchical higher-order structures of polymer crystals such as folded-chain lamellar crystals and spherulites, as well as deformation and thermal behavior of polymer crystals will be discussed.
Liquid-Crystalline Polymers	1	The lecture on the self-assembled structure of liquid-crystalline polymers will be given. Their phase diagrams, defects, domain structures, and structure-property relationships will be mentioned.
Polymer Blends	4	Miscubility, phase-diagrams, mechanisms and dynamics of phase transitions, relationships between phase-separated structures and properties, methods to control the phase-separated structures will be discussed.
Block and Graft Copolymers	7	The lectures include nano-scale domain formation of block copolymers by microphase-separation, miscibility and phase diagrams, order-disorder and order-order transitions, bicontinuous structures, structure formation in thin films, blends with homopolymers or other block copolymers, multi-component multi-block copolymers, miktoarm star block copolymers, and more.

【Textbook】Not used.

【Textbook(supplemental)】Given in the lectures.

【Prerequisite(s)】Thermodynamics preferable.

【Web Sites】

【Additional Information】

10D625

Polymer Spectroscopy

高分子分光学

【Code】10D625 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	4	
	2	
	2	
	3	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D628

Design of Polymer Materials

高分子材料設計

【Code】10D628 【Course Year】Master Course 【Term】2nd term 【Class day & Period】

【Location】ICR Seminar Room 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	2	
	2	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D647

Polymer Controlled Synthesis

高分子制御合成

【Code】10D647 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	2	
	1	
	1	
	6	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D633

Biomaterials Science and Engineering

高分子医工学

【Code】10D633 【Course Year】Master Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	2	
	2	
	1	
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D802

Organic System Design

有機設計学

【Code】10D802 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Fri 2nd 【Location】A2-308 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D804

Synthetic Organic Chemistry

有機合成化学

【Code】10D804 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 2nd 【Location】A2-308 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D808

物理有機化学

【Code】10D808 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 2nd 【Location】A2-308 【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D815

Biorecognics

生体認識化学

【Code】10D815 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Thu 2nd 【Location】A2-308 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D818

Advanced Organic Chemistry

先端有機化学

【Code】10D818 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 1st

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D041

Organotransition Metal Chemistry 1

有機金属化学 1

【Code】10D041 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	1	
	2	
	1	
	2	
	3	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D042

Organotransition Metal Chemistry 2

有機金属化学２

【Code】10D042 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Fri 1st

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D819

Synthetic Chemistry and Biological Chemistry, Adv, Ⅰ

合成・生物化学特論第一

【Code】10D819 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	2	
	1	
	2	
	2	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D822

Synthetic Chemistry and Biological Chemistry, Adv, Ⅳ

合成・生物化学特論第四

【Code】10D822 【Course Year】Master Course 【Term】1st term 【Class day & Period】 【Location】A2-306

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D824

Synthetic Chemistry and Biological Chemistry, Adv, VI

合成・生物化学特論第六

【Code】10D824 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Wed 2nd

【Location】A2-308 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D825

Synthetic Chemistry and Biological Chemistry, Adv, Ⅶ

合成・生物化学特論第七

【Code】10D825 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】A2-308 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D827

Synthetic Chemistry and Biological Chemistry, Adv, IX

合成・生物化学特論第九

【Code】10D827 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 2nd

【Location】A2-308 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Jun-ya HASEGAWA

【Course Description】The lecture focuses on learning the basic and applied theories of quantum chemistry.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	2	
	2	
	2	
	2	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D828

Special Experiments and Exercises in Synthetic Chemistry and Biological Chemistry

合成・生物化学特別実験及演習

【Code】10D828 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】8 【Restriction】No Restriction 【Lecture Form(s)】Experiment and Exercise 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K001

Introduction to Advanced Material Science and Technology

先端マテリアルサイエンス通論

【Code】10K001

【Course Year】Special Auditors, Special research Students, Graduate School Students (inc. International Course Students)

【Term】1st term

【Class day & Period】Starting from April 15, the lecture will be held from 2:45 p.m. to 4:15 p.m. on Friday afternoon but some lectures are from 4:30 p.m.

【Location】Distance lectures are held between Lecture Room 1 in Engineering Bld. 8 at Yoshida campus and Seminar Room 131 in Bld. A1 at Katsura campus. Attend either of them at your convenience.

【Credits】2 【Restriction】 【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】The various technologies used in the field of material science serve as bases for so-called "high technologies", and, in turn, the high technologies develop material science. These relate to each other very closely and contribute to the development of modern industries. In this class, recent progresses in material science are briefly introduced, along with selected current topics on new biomaterials, nuclear engineering materials, new metal materials and natural raw materials. The methods of material analysis and future developments in material science are also discussed.

【Grading】In order to obtain two credits, students must attend at least ten lectures, and at least five of the submitted reports must be evaluated as “passed” by each lecturer. Each report should be submitted to the lecturer within two weeks after his/her lecture. NOTE: Reports are NOT acceptable from those who do not attend the lecture.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	15	

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K004

New Engineering Materials, Adv.

新工業素材特論

【Code】10K004 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 5th

【Location】(Katsura)A1-131 (Yoshida)Lecture Room3,Reseach Bldg.No.4 【Credits】2 【Restriction】

【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	Composite Materials: Smart, Lightweight and Strong Materials (HOJO)
	1	Innovations in High Performance Steels for Bridge Construction (SUGIURA)
	1	Materials in Micro Electro Mechanical Systems (MEMS) (TSUCHIYA)
	1	High Temperature Superconductivity and Its Application to Electronics(SUZUKI)
	1	Sustainability Issues(SHIMIZU)
	1	Material Properties of Fiber Reinforced Cementitious Composites and Applicability to Structures (KANEKO)
	1	Structural biochemistry of proteins (SHIRAKAWA)
	2	Semiconductor Materials and Devices (KIMOTO)
	1	Separation Analysis in Micro- and Nano-scale (OTSUKA)
	1	Polymer Synthesis beyond the 21st Century:Precision Polymerizations and Novel Polymeric Materials (SAWAMOTO)
	1	Inorganic New Materials (EGUCHI)

【Textbook】

【Textbook(supplemental)】Class handouts

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D043

Instrumental Analysis, Adv. I

先端科学機器分析及び実習 I

【Code】10D043 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】

【Location】A2-304 【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D046

Instrumental Analysis, Adv. II

先端科学機器分析及び実習 II

【Code】10D046 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】

【Location】A2-304 【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D051

Frontiers in Modern Science & Technology

現代科学技術の巨人セミナー「知のひらめき」

【Code】10D051 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 5th

【Location】Katsura Hall 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D040

Exercise in Practical Scientific English

実践的科学英語演習「留学ノススメ」

【Code】10D040 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】Seminar 【Language】English 【Instructor】Kenji Wada. etc

【Course Description】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Grading】Attendance 60%, midterm reports 20%, final report 20%. The final report must be submitted by the deadline date.

【Course Goals】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Course Guidance, etc.
Exercise-1	1	Definition of technical writing 3C in technical writing Weaknesses of Japanese writers Good examples and bad examples
Exercise-2	1	Punctuation Presentation skills 1 -organization
Exercise-3	1	Organizing your thoughts for the title and abstract Presentation skills 2 ?Visual aspects
Exercise-4	1	Presenting the background of your research Presentation skills 3 ?Oral Aspects
Exercise-5	1	Describing how you did your research Presentation skills 4 ?Physical Aspects
Exercise-6	1	Presenting what you observed Presentation Practice
Exercise-7	1	Placing your findings in the field Presentation Practice
Exercise-8	1	Expressing thanks and listing references Presentation practice
Exercise-9	1	Writing your proposal Presentation practice
Exercise-10	1	Presentation practice Reviews & Feedbacks Evaluation
Wrap-up lecture	1~2	Current situation of studying abraod, etc.

【Textbook】No textbook is required.

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.ehcc.kyoto-u.ac.jp/alc/ (needs passwords).

【Additional Information】For details, contact Dr. Wada (wadaken@scl.kyoto-u.ac.jp).

10S807

Special Seminar 1in Synthetic Chemistry and Biological Chemistry

合成・生物化学特別セミナー１

【Code】10S807 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S808

Special Seminar 2in Synthetic Chemistry and Biological Chemistry

合成・生物化学特別セミナー２

【Code】10S808 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10S809

Special Seminar 3 in Synthetic Chemistry and Biological Chemistry

合成・生物化学特別セミナー３

【Code】10S809 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C294

Integrated Molecular Science IV

統合物質科学IV

【Code】10C294 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】Faculty of Science Bldg.No.6 Room402 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Relay Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C296

Integrated Materials Science IV

統合材料科学IV

【Code】10C296 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 3rd

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D805

Functional Coordination Chemistry

機能性錯体化学

【Code】10D805 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】

【Location】A2-308 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Fundamental coordination chemistry	3	
Properties of coordinaton compounds	2	
Porous coordination polymers	3	
Functions of coordination polymers	3	
coordination compounds and polymers	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D834

Fine Synthetic Chemistry

精密合成化学

【Code】10D834 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D813

Bioorganic Chemistry

生物有機化学

【Code】10D813 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D812

Molecular Biology

分子生物化学

【Code】10D812 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】Biological responses are elicited at the interface of intrinsic genetic information and extrinsic environmental factors. This course discusses on molecular aspects of brain function and immunity. Experimental tools such as fluorescent probes for second messenger molecules are also explained through performance of experiments using the probes.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Basics	1	
Principles of neurotransmission	3	
Immunity and inflammation	3	
Gaseous bioactive molecules	3	
Experiments to observe cellular responses	3	

【Textbook】Provided in the course

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D816

Biotechnology

生物工学

【Code】10D816 【Course Year】Master and Doctor Course 【Term】 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D820

Synthetic Chemistry and Biological Chemistry, Adv, II

合成・生物化学特論第二

【Code】10D820 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Intensive Course

【Location】(undecided)【Credits】2【Restriction】No Restriction【Lecture Form(s)】Lecture【Language】Japanese

【Instructor】Visiting Professors

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D821

Synthetic Chemistry and Biological Chemistry, Adv,

合成・生物化学特論第三

【Code】10D821 【Course Year】Master Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	4	
	3	
	3	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D823

Synthetic Chemistry and Biological Chemistry, Adv, Ⅴ

合成・生物化学特論第五

【Code】10D823 【Course Year】Master Course 【Term】1st term 【Class day & Period】Intensive Course

【Location】 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Visiting Professors

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D826

Synthetic Chemistry and Biological Chemistry, Adv, VIII

合成・生物化学特論第八

【Code】10D826 【Course Year】Master Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E001

Special Topics in Transport Phenomena

移動現象特論

【Code】10E001 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Wed 4th 【Location】A2-305 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】R.Yamamoto

【Course Description】Theoretical approaches on momentum, heat, and mass transports will be discussed. For example, problems of non-steady transport such as transient behavior, hydrodynamics of complex fluids such as polymeric liquids will be treated.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	6	
	3	
	3	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E004

Separation Process Engineeering, Adv.

分離操作特論

【Code】10E004 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 2nd 【Location】A2-305 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】H.Tamon, N.Sano

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	1	
	1	
	2	
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E007

Chemical Reaction Engineering, Adv.

反応工学特論

【Code】10E007 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Fri 2nd

【Location】A2-305 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Miura, Kawase

【Course Description】Kinetic analysis of gas-solid-catalyst reaction and gas-solid reaction
Operation and design of reactors for gas-solid-catalyst and gas-solid reactions
Industrial reactors including fixed bed, fluidized bed, moving bed, simulated moving bed, and stirred tank types

【Grading】Based on the result of examination at the end of term and the results of quizzes and reports imposed every week

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Gas-solid reaction I. Industrial gas-solid reactions	2	As examples of industrial gas-solid reactions, the pyrolysis (carbonization) and gasification of coal as well as reactors for these reactions are explained.
Gas-solid reaction II. Kinetic analysis of gas-solid reaction	3	Kinetic measurement and analysis of complicated reactions, particularly coal pyrolysis, are explained from the first-order reaction model to the distributed activation energy model (DAEM).
Gas-solid reaction III. Models of gas-solid reactions	2	Concepts and derivation of the reaction models including the grain model and the random-pore model are explained. Application of the models to coal gasification is overviewed.
Gas-solid-catalyst reaction I. Effectiveness factor and selectivity	2	Commercial catalysts and industrial gas-solid-catalyst reactions are overviewed. The generalized effectiveness factor and the selectivity affected by mass transfer are explained.
Gas-solid-catalyst reaction II. Industrial catalytic reactors	2	Industrial catalytic reactors including fixed-bed and fluidized-bed reactors are overviewed. Design and operation of these reactors including thermal stability are explained.
Gas-solid-catalyst reaction III. Deactivation and regeneration of catalyst	3	Deactivation mechanisms of solid catalysts are overviewed. The deactivation and consequent change in selectivity are explained in terms of the decay function and specific activity.

【Textbook】Prints are distributed.

【Textbook(supplemental)】

【Prerequisite(s)】Needs knowledge of chemical reaction engineering including heterogeneous reactions.

【Web Sites】

【Additional Information】

10E053

Process Data Analysis

プロセスデータ解析学

【Code】10E053 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Wed 3rd

【Location】A2-305 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】M. Kano and S. Hasebe

【Course Description】Process data analysis methods for product quality prediction, fault detection and diagnosis, and product yield improvement is explained together with their industrial applications. The basics and methods covered in this lecture are: basics of probability and statistics, correlation analysis, regression analysis, multivariate analysis such as principal component analysis, discriminant analysis, and partial least squares. In addition, soft-sensor design and multivariate statistical process control are explained.

【Grading】Based on both the examination result and reports.

【Course Goals】To understand the basics of probability and statistics.
To understand multivariate analysis.
To be able to apply process data analysis to practical problems.

【Course Topics】

Theme	Class number of times	Description
what is process data analysis	1	
preparation for data analysis	1	
point estimation and interval estimation	2-3	
regression analysis	2-3	
multivariate analysis	3-5	
soft-sensor design	1-2	
multivariate statistical process control	1-2	
current topics	1	

【Textbook】Prints are distributed.

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E016

Fine Particle Technology, Adv.

微粒子工学特論

【Code】10E016 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】A2-302 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Shuji Matsusaka

【Course Description】Analyses of particle behavior in gases, Particle handling operations, and measurement methods are lectured. Also, particle charging that affect particle behavior in gases are theoretically explained. Furthermore, the control of the particle charging and its applications are lectured.

【Grading】Examination

【Course Goals】Understand the analysis and modeling of dynamic behavior of particles. Furthermore develop the ability to apply the knowledge for particle handling and processing.

【Course Topics】

Theme	Class number of times	Description
Particle properties and measurements	3	Mathematical description of particle diameter distribution, properties of fine particles, and their measurement methods are explained.
Particle adhesion and dynamical analysis	3	Measurement methods for adhesion forces of particles and dynamical analysis method for particle collision and elastic deformation are lectured.
Behavior of particles in airflow	4	Temporal and spatial distribution of deposition and reentrainment of fine particles in gas-solid flow are explained using physical models and probability theory. In addition, complicated reentrainment phenomena during particle collision are discussed.
Particle charging and control	3	Concept of particle charging and quantitative analysis methods of charging process are explained; also, charge distribution of particles is analyzed. Furthermore, new methods to control particle charge are introduced.
Particle sampling	1	Sampling of fine particles and statistical evaluation methods are explained.

【Textbook】Lecture notes

【Textbook(supplemental)】K. Okuyama, H. Masuda and S. Morooka: Biryuushi Kougaku － Fine particle technology, Ohmsha, Tokyo (1992)

【Prerequisite(s)】Basic knowledge on powder technology in bachelor course

【Web Sites】

【Additional Information】

10E019

Surface Control Engineering

界面制御工学

【Code】10E019 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】A2-305 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese

【Instructor】M.Miyahara

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	4	
	2	
	5	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E022

Engineering for Chemical Materials Processing

化学材料プロセス工学

【Code】10E022 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 3rd

【Location】A2-302 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】M.Ohshima,S.Nagamine

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	2	
	2	
	3	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E023

Environmental System Engineerig

環境システム工学

【Code】10E023 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 2nd

【Location】A2-305 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese

【Instructor】K.Mae,S.Maki,O.Ohkuma

【Course Description】First, we overview the concept of environmentally benign chemical processing based on the causal relation between energy and environmental issues. Then, we discuss various new technologies for energy production and environmentally harmonized processes from the viewpoint of chemical engineering.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	3	
	2	
	2	
	2	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

653286

Molecular Science of Fluids

流体物性概論

【Code】653286 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Wed 3rd

【Location】Faculty of Engineering Bldg.No.2 Room201 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】M.Kinoshita

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E037

Special Topics in English for Chemical Engineering

化学技術英語特論

【Code】10E037 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】

【Location】A2-305 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	6	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E039

Ethics for Chemical Engineers

化学技術者倫理

【Code】10E039 【Course Year】Master and Doctor Course 【Term】1st term

【Class day & Period】Tue 3rd and 4th 【Location】A2-303 【Credits】2 【Restriction】 【Lecture Form(s)】

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	4	
	6	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E031

Special Topics in Chemical Engineering I

化学工学特論第一

【Code】10E031 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 1st

【Location】A2-305 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】H.Nakagawa

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	3	
	1	
	2	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E032

Special Topics in Chemical Engineering II

化学工学特論第二

【Code】10E032 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 2nd

【Location】A2-305 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】H.Shinto

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	3	
	3	
	1	
	1	
	1	
	1	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E033

Special Topics in Chemical Engineering III

化学工学特論第三

【Code】10E033 【Course Year】Master Course 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	10	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E034

Special Topics in Chemical Engineering IV

化学工学特論第四

【Code】10E034 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	10	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E041

Research Internship in Chemical Engineering

研究インターンシップ（化学工学）

【Code】10E041 【Course Year】Master and Doctor Course 【Term】1st+2nd term 【Class day & Period】

【Location】 【Credits】2 【Restriction】 【Lecture Form(s)】Exercise 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E043

Seminar in Chemical Engineering

化学工学セミナー

【Code】10E043 【Course Year】Master and Doctor Course 【Term】1st+2nd term 【Class day & Period】

【Location】 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10i027

Chemical Engineering for Advanced Materials

先端物質化学工学

【Code】10i027 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】Oct. 14, 21, 28, Nov. 4 10:30-18:00
【Location】A2-304 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English
【Instructor】Prof. Wiwut Tanthapanichakoon, PhD, Department of Chemical Engineering, Graduate School of Science & Engineering, Tokyo Institute of Technology
【Course Description】The main objective of this 2-credit graduate course is to explain how (selected) advanced materials are designed, synthesized and/or processed (manufactured) in the research labs and certain high-tech industries, whilst pointing out the key roles played by Chemical Engineering in the relevant stages of developments.
【Grading】Class attendance: 20 points Individual Presentation of Assigned Projects & Presentation Files: 40 points Full Individual Project Report: 40 points Total: 100 points There will be no examination. Individual topic assignment as well as the Format of oral presentation and report will be given on the first day of lectures.
【Course Goals】
【Course Topics】

Theme	Class number of times	Description
1. Chemistry of advanced materials		
2. Nanotechnology, nanomaterials, and nanoparticles		
3. The nanostructure of aerogels: Preparation, investigations, modifications, and utilizations		
4. Dispersion of fine silica particles using alkoxysilane and industrialization		
5. Carbon nanotubes in multifunctional polymer nanocomposites		
6. Development of polymer-clay nanocomposites by dispersion of particles into polymer materials		
7. Ceramic filter for trapping diesel particles		
8.Zeolite membrane		
9. Development of new cosmetics based on nanoparticles		
10. Development of functional skincare cosmetics using biodegradable PLGA nanospheres		

【Textbook】
【Textbook(supplemental)】
【Prerequisite(s)】
【Web Sites】
【Additional Information】Lecture hours: 15 x 90 minutes = 1,350 min. (The 4th Friday may end around 16:30 instead of 18:00)

10E045

Reseach in Chemical Engineering I

化学工学特別実験及演習Ⅰ

【Code】10E045 【Course Year】Master 1st 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E047

Reseach in Chemical Engineering II

化学工学特別実験及演習 II

【Code】10E047 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E049

Reseach in Chemical Engineering III

化学工学特別実験及演習III

【Code】10E049 【Course Year】Master 2nd 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10E051

Reseach in Chemical Engineering IV

化学工学特別実験及演習IV

【Code】10E051 【Course Year】Master 2nd 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Seminar and Exercise 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K001

Introduction to Advanced Material Science and Technology

先端マテリアルサイエンス通論

【Code】10K001

【Course Year】Special Auditors, Special research Students, Graduate School Students (inc. International Course Students)

【Term】1st term

【Class day & Period】Starting from April 15, the lecture will be held from 2:45 p.m. to 4:15 p.m. on Friday afternoon but some lectures are from 4:30 p.m.

【Location】Distance lectures are held between Lecture Room 1 in Engineering Bld. 8 at Yoshida campus and Seminar Room 131 in Bld. A1 at Katsura campus. Attend either of them at your convenience.

【Credits】2 【Restriction】 【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】The various technologies used in the field of material science serve as bases for so-called "high technologies", and, in turn, the high technologies develop material science. These relate to each other very closely and contribute to the development of modern industries. In this class, recent progresses in material science are briefly introduced, along with selected current topics on new biomaterials, nuclear engineering materials, new metal materials and natural raw materials. The methods of material analysis and future developments in material science are also discussed.

【Grading】In order to obtain two credits, students must attend at least ten lectures, and at least five of the submitted reports must be evaluated as “passed” by each lecturer. Each report should be submitted to the lecturer within two weeks after his/her lecture. NOTE: Reports are NOT acceptable from those who do not attend the lecture.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	15	

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10K004

New Engineering Materials, Adv.

新工業素材特論

【Code】10K004 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 5th 【Location】(Katsura)A1-131 (Yoshida)Lecture Room3,Reseach Bldg.No.4 【Credits】2 【Restriction】 【Lecture Form(s)】Relay Lecture 【Language】English 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	Composite Materials: Smart, Lightweight and Strong Materials (HOJO)
	1	Innovations in High Performance Steels for Bridge Construction (SUGIURA)
	1	Materials in Micro Electro Mechanical Systems (MEMS) (TSUCHIYA)
	1	High Temperature Superconductivity and Its Application to Electronics(SUZUKI)
	1	Sustainability Issues(SHIMIZU)
	1	Material Properties of Fiber Reinforced Cementitious Composites and Applicability to Structures (KANEKO)
	1	Structural biochemistry of proteins (SHIRAKAWA)
	2	Semiconductor Materials and Devices (KIMOTO)
	1	Separation Analysis in Micro- and Nano-scale (OTSUKA)
	1	Polymer Synthesis beyond the 21st Century:Precision Polymerizations and Novel Polymeric Materials (SAWAMOTO)
	1	Inorganic New Materials (EGUCHI)

【Textbook】

【Textbook(supplemental)】Class handouts

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D043

Instrumental Analysis, Adv. I

先端科学機器分析及び実習 I

【Code】10D043 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】

【Location】A2-304 【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D046

Instrumental Analysis, Adv. II

先端科学機器分析及び実習 II

【Code】10D046 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】

【Location】A2-304 【Credits】1 【Restriction】 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	2	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D051

Frontiers in Modern Science & Technology

現代科学技術の巨人セミナー「知のひらめき」

【Code】10D051 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 5th

【Location】Katsura Hall 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	14	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D040

Exercise in Practical Scientific English

実践的科学英語演習「留学ノススメ」

【Code】10D040 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】【Location】

【Credits】1 【Restriction】 【Lecture Form(s)】Seminar 【Language】English 【Instructor】Kenji Wada. etc

【Course Description】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Grading】Attendance 60%, midterm reports 20%, final report 20%. The final report must be submitted by the deadline date.

【Course Goals】This course is designed to develop high-level communication and presentation skills in English required for top level scientific and industrial career prospects.

【Course Topics】

Theme	Class number of times	Description
Introduction	1	Course Guidance, etc.
Exercise-1	1	Definition of technical writing 3C in technical writing Weaknesses of Japanese writers Good examples and bad examples
Exercise-2	1	Punctuation Presentation skills 1 -organization
Exercise-3	1	Organizing your thoughts for the title and abstract Presentation skills 2 ?Visual aspects
Exercise-4	1	Presenting the background of your research Presentation skills 3 ?Oral Aspects
Exercise-5	1	Describing how you did your research Presentation skills 4 ?Physical Aspects
Exercise-6	1	Presenting what you observed Presentation Practice
Exercise-7	1	Placing your findings in the field Presentation Practice
Exercise-8	1	Expressing thanks and listing references Presentation practice
Exercise-9	1	Writing your proposal Presentation practice
Exercise-10	1	Presentation practice Reviews & Feedbacks Evaluation
Wrap-up lecture	1~2	Current situation of studying abraod, etc.

【Textbook】No textbook is required.

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】http://www.ehcc.kyoto-u.ac.jp/alc/ (needs passwords).

【Additional Information】For details, contact Dr. Wada (wadaken@scl.kyoto-u.ac.jp).

10C294

Integrated Molecular Science IV

統合物質科学IV

【Code】10C294 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】Faculty of Science Bldg.No.6 Room402 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Relay Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C296

Integrated Materials Science IV

統合材料科学IV

【Code】10C296 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 3rd

【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture

【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10T004

Special Seminar of Chemical Engineering 1

化学工学特別セミナー１

【Code】10T004 【Course Year】Doctor 1st 【Term】1st term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	2	
	2	
	2	
	2	
	1	
	2	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10T005

Special Seminar in Chemical Engineering 2

化学工学特別セミナー２

【Code】10T005 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】A2-305 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】K.Mae,T.Maki

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	3	
	4	
	3	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10T006

Special Seminar of Chemical Engineering 3

化学工学特別セミナー３

【Code】10T006 【Course Year】Doctor 1st 【Term】2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	1	
	2	
	2	
	2	
	1	
	1	
	1	
	1	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10T009

Special Seminar in Chemical Engineering 6

化学工学特別セミナー 6

【Code】10T009 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】 【Location】A2-304

【Credits】2 【Restriction】 【Lecture Form(s)】 【Language】Japanese

【Instructor】R.Yamamoto,M.Kawase,K.Miura,S.Hasebe,S.Matsuzaka

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Required master degree knowledge on chemical engineering

【Web Sites】

【Additional Information】

10T010

Special Seminar in Chemical Engineering 7

化学工学特別セミナー７

【Code】10T010 【Course Year】Doctor Course 【Term】2nd term 【Class day & Period】 【Location】A2-302

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese 【Instructor】S.Matsusaka

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	4	
	4	
	4	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Required master degree knowledge on chemical engineering

【Web Sites】

【Additional Information】

10E010

Advanced Process Systems Engineering

プロセスシステム論

【Code】10E010 【Course Year】Master and Doctor Course 【Term】 【Class day & Period】

【Location】A2-305 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	1	
	2	
	3	
	5	
	3	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10T007

Special Seminar in Chemical Engineering 4

化学工学特別セミナー４

【Code】10T007 【Course Year】Doctor Course 【Term】 【Class day & Period】 【Location】A2-305

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Required master degree knowledge on chemical engineering

【Web Sites】

【Additional Information】

10T008

Special Seminar in Chemical Engineering 5

化学工学特別セミナー５

【Code】10T008 【Course Year】Doctor Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
	3	
	3	
	3	
	3	
	2	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

工学研究科シラバス 2011 年度版
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