# *SYLLABUS* *2010*

## [B] Master's Program

Kyoto University, Graduate School of Engineering

# [B] Master's Program

## Civiland Earth Resources Engineering

**Urban Management**

**Urbanand Enviromental Engineering**

**Architecture and Architectural Engineering**

**Mechanical Engineering and Science**

**Micro Engineering**

**Aeronautics and Astronautics**

**Nuclear Engineering**

## Materials Science and Engineering



## Electrical Engineering

**Electronic Science and Engineering**



**Materials Science and Engineering**

**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】1st term: C1-172 2nd term: C1-173

【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】

【Course Goals】

【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】

【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】

【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】

【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】Takeshi Tamura, Tomomi Yagi, Yoshikawa Hitoshi
【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 | 1 | - Strain tensors<br>- 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 | | |
| Variational principle | 1 | |
| Various kinds of numerical analyses | 1 | |
| Topics | 1 | |

【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】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【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】Japanese 【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】 【Term】1st term 【Class day & Period】Tue 1st 【Location】C1-191

【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】

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】Japanese

【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.

【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. |
| History of Structural Design | 1 | The history of structural design, especially in focusing the era of the post-Industrial Revolution that influenced on the modern structural design strongly; the process of the engineering refinement of structural form; and the structural art constructed as a result of it are lectured. |
| Structure and Form | 1 | 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 relationships of continuity and symmetry. Furthermore, the methods of the operation of structural form are given. |
| 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. |
| 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)
The Tower and the Bridge, The New Art of Structural Engineering, D.P. Billington, Princeton University Press,1985 (for Y. Kubota)

【Textbook(supplemental)】given in the lectures.

【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, History, Forms and Excellent designs 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<br>- Types of steel structures<br>- Future trend of steel structures |
| Material behavior, Initial imperfections and Damages | 1 | - Construction of steel structures<br>- Residual stresses and initial deformations<br>- Damages |
| Stress-strain relationship, Joints | 1 | - Yield surfaces<br>- Bauschinger effect<br>- Hardening effect<br>- Welded joint<br>- Bolted joint |
| Fatigue fracture, fatigue life and fatigue design | 1 | - S-N design curve<br>- Fatigue crack growth, stress intensity factor<br>- Miner's rule on damage accumulation<br>- Repair of fatigue damage |
| Structural stability and design for buckling | 1 | - Structural instability and accident<br>- Theory of Stability<br>- Compressive members, etc. |
| Corrosion and anti-corrosion of steel structures | 1 | - Mechanism of corrosion<br>- Micro- and Macro- cells<br>- Anti-corrsion<br>- Life-cycle costs |
| Wind resistant design of structures | 2 | - Natural winds due to Typhoon, Tornado and so on<br>- Evaluation and estimation of strong winds<br>- Wind resistant design methods<br>- Various kinds of design codes |
| Aerodynamic instabilities of structures | 3 | - Introduction of aerodynamic instabilities (ex. vortex-induced vibration, galloping, flutter, buffeting, cable vibrations)<br>- Mechanisms of aerodynamic instabilities<br>- Evaluation methods and Countermeasures |
| Wind-induced disaster | 1 | - Accidents on structures due to strong winds<br>- 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 4th

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

【Instructor】Igarashi

【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】

【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【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 | 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 | 1 | 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

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】Japanese 【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

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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【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】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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】Doctor Course 【Term】2nd term 【Class day & Period】Tue 3rd

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

【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. |
| | 3 | |
| 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】Japanese

【Instructor】Tohiharu Kojiri, Tetsuya Sumi, Tomoharu Hori, 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】【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】

10F025

# Geomechanics

地盤力学

【Code】10F025 【Course Year】 【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 |
|---|---|---|

【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】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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 |
|---|---|---|

【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 5th

【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 | |
| Geotechnical survey | 4 | Introduction of geotechnical survey, Geophysical exploration, Inversion technique, Practical works of field measurements |
| | 4 | |
| | 5 | |

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Students can contact with professors by visiting theri rooms after making appointment by e-mail. Ohtsu@toshi.kuciv.kyoto-u.ac.jp kishida.kiyoshi.3r@kyoto-u.ac.jp shiotani@toshi.kuciv.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

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.<br>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<br>Mechanisms of soil and groundwater contamination<br>Remediation of soil and groundwater contamination<br>Case histories |
| Geotechnics on waste disposal | 4 | Functions and structures of waste containment facilities<br>Geotechnics on the liner system (Geosynthetics, clay liner, Leachate collection layer)<br>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)<br>Geoenvironmental impact assessment and control of waste utilization<br>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】

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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【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 |
|---|---|---|
| | 1 | |
| | 1 | |
| | 1 | |
| | 3 | |
| | 1 | |
| fundamentals of dynamics | 3 | fundamentals of dyanamics for numerical analysis of geo-hazards during earthquakes |
| mechanics of granular materials | 3 | 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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F215

# Intelligent Transportation Systems

交通情報工学

【Code】10F215 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Fri 2nd

【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 |
|---|---|---|

【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<br>2. Applications in environmental and disaster prevention fields |
| Classification of electromagnetic waves and satellite sensors | 1 | 1. Classification of electromagnetic waves<br>2. Basic terms on electromagnetic radiation<br>3. Theory of electromagnetic radiation from objects<br>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<br>1.1 Bidirectional reflectance distribution function<br>1.2 Bidirectional reflectance factor<br>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<br>2. Atmospheric radiative transfer of electromagnetic waves<br>3. Atmospheric effects on satellite observations<br>4. Correction of atmospheric effects |
| Optical sensors | 1 | 1. Principles of visible and reflective infrared sensors<br>2. Examples of visible and reflective infrared sensors<br>3. Applications of reflective infrared sensors |
| Thermal infrared sensors | 1 | 1. Principles of thermal infrared sensors<br>2. Measurements of surface temperature by satellite sensors<br>3. Examples of thermal infrared sensors<br>4. Applications of thermal infrared sensors |
| Image processing 1 (Image correction) | 1 | 1. Image processing procedure<br>2. Image enhancement<br>3. Image correction<br>4. Correction of geometrical distortion |
| Image processing 2 (Image classification) | 1 | 1. What is image classification?<br>2. Theory of image classification<br>3. Classification rules<br>4. Image classification procedure |
| Microwave sensors | 2 | 1. Microwave<br>2. Microwave sensors<br>3. Real Aperture Radar (RAR)<br>4. Synthetic Aperture Radar (SAR)<br>5. Interferometric SAR<br>6. Differential Interferometric SAR |
| Laser data | 2 | 1. Statistical processing of point clouds<br>2. Three-dimensional modeling using terrestrial laser data<br>3. Three-dimensional modeling using airborne laser data |
| Image processing 3 | 1 | 1. Edge extraction<br>2. Segmentation<br>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 2nd

【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 |
|---|---|---|

【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】Tue 1st

【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 |
|---|---|---|

【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】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】

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】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693287

# Disaster Information Management

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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

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】 【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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】Fri 1st

【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】

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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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】

10A420

# Lecture on Exploration Geophysics

探査工学特論

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

【Location】C1-117 【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】

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.
【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.

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 |
|---|---|---|

【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】C1-171 【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 | 1 | |
| 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】【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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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】

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

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

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

【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】2nd floor conference room, UPL karasuma office 【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, JongJin Yoon

【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】2nd floor conference room, UPL karasuma office 【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, and Tetsuharu Oba

【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】

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】1st term: C1-172 2nd term: C1-173

【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】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Details are 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】

【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】

【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】

【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】Takeshi Tamura, Tomomi Yagi, Yoshikawa Hitoshi
【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 | 1 | - Strain tensors<br>- 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 | | |
| Variational principle | 1 | |
| Various kinds of numerical analyses | 1 | |
| Topics | 1 | |

【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】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【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】Japanese 【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】 【Term】1st term 【Class day & Period】Tue 1st 【Location】C1-191

【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】

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】Japanese

【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.

【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. |
| History of Structural Design | 1 | The history of structural design, especially in focusing the era of the post-Industrial Revolution that influenced on the modern structural design strongly; the process of the engineering refinement of structural form; and the structural art constructed as a result of it are lectured. |
| Structure and Form | 1 | 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 relationships of continuity and symmetry. Furthermore, the methods of the operation of structural form are given. |
| 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. |
| 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)
The Tower and the Bridge, The New Art of Structural Engineering, D.P. Billington, Princeton University Press,1985 (for Y. Kubota)

【Textbook(supplemental)】given in the lectures.

【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, History, Forms and Excellent designs 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<br>- Types of steel structures<br>- Future trend of steel structures |
| Material behavior, Initial imperfections and Damages | 1 | - Construction of steel structures<br>- Residual stresses and initial deformations<br>- Damages |
| Stress-strain relationship, Joints | 1 | - Yield surfaces<br>- Bauschinger effect<br>- Hardening effect<br>- Welded joint<br>- Bolted joint |
| Fatigue fracture, fatigue life and fatigue design | 1 | - S-N design curve<br>- Fatigue crack growth, stress intensity factor<br>- Miner's rule on damage accumulation<br>- Repair of fatigue damage |
| Structural stability and design for buckling | 1 | - Structural instability and accident<br>- Theory of Stability<br>- Compressive members, etc. |
| Corrosion and anti-corrosion of steel structures | 1 | - Mechanism of corrosion<br>- Micro- and Macro- cells<br>- Anti-corrsion<br>- Life-cycle costs |
| Wind resistant design of structures | 2 | - Natural winds due to Typhoon, Tornado and so on<br>- Evaluation and estimation of strong winds<br>- Wind resistant design methods<br>- Various kinds of design codes |
| Aerodynamic instabilities of structures | 3 | - Introduction of aerodynamic instabilities (ex. vortex-induced vibration, galloping, flutter, buffeting, cable vibrations)<br>- Mechanisms of aerodynamic instabilities<br>- Evaluation methods and Countermeasures |
| Wind-induced disaster | 1 | - Accidents on structures due to strong winds<br>- 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 4th

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

【Instructor】Igarashi

【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】

【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【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 | 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 | 1 | 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

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】Japanese 【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

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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【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】Japanese

【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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】Doctor Course 【Term】2nd term 【Class day & Period】Tue 3rd

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

【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. |
| | 3 | |
| 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】Japanese

【Instructor】Tohiharu Kojiri, Tetsuya Sumi, Tomoharu Hori, 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】【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】

10F025

# Geomechanics

地盤力学

【Code】10F025 【Course Year】 【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 |
|---|---|---|

【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】Japanese 【Instructor】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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 |
|---|---|---|

【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 5th

【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 | |
| Geotechnical survey | 4 | Introduction of geotechnical survey, Geophysical exploration, Inversion technique, Practical works of field measurements |
| | 4 | |
| | 5 | |

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】Students can contact with professors by visiting theri rooms after making appointment by e-mail. Ohtsu@toshi.kuciv.kyoto-u.ac.jp kishida.kiyoshi.3r@kyoto-u.ac.jp shiotani@toshi.kuciv.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

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.<br>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<br>Mechanisms of soil and groundwater contamination<br>Remediation of soil and groundwater contamination<br>Case histories |
| Geotechnics on waste disposal | 4 | Functions and structures of waste containment facilities<br>Geotechnics on the liner system (Geosynthetics, clay liner, Leachate collection layer)<br>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)<br>Geoenvironmental impact assessment and control of waste utilization<br>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】

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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【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 |
|---|---|---|
| | 1 | |
| | 1 | |
| | 1 | |
| | 3 | |
| | 1 | |
| fundamentals of dynamics | 3 | fundamentals of dyanamics for numerical analysis of geo-hazards during earthquakes |
| mechanics of granular materials | 3 | 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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F215

# Intelligent Transportation Systems

交通情報工学

【Code】10F215 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Fri 2nd

【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 |
|---|---|---|

【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<br>2. Applications in environmental and disaster prevention fields |
| Classification of electromagnetic waves and satellite sensors | 1 | 1. Classification of electromagnetic waves<br>2. Basic terms on electromagnetic radiation<br>3. Theory of electromagnetic radiation from objects<br>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<br>1.1 Bidirectional reflectance distribution function<br>1.2 Bidirectional reflectance factor<br>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<br>2. Atmospheric radiative transfer of electromagnetic waves<br>3. Atmospheric effects on satellite observations<br>4. Correction of atmospheric effects |
| Optical sensors | 1 | 1. Principles of visible and reflective infrared sensors<br>2. Examples of visible and reflective infrared sensors<br>3. Applications of reflective infrared sensors |
| Thermal infrared sensors | 1 | 1. Principles of thermal infrared sensors<br>2. Measurements of surface temperature by satellite sensors<br>3. Examples of thermal infrared sensors<br>4. Applications of thermal infrared sensors |
| Image processing 1 (Image correction) | 1 | 1. Image processing procedure<br>2. Image enhancement<br>3. Image correction<br>4. Correction of geometrical distortion |
| Image processing 2 (Image classification) | 1 | 1. What is image classification?<br>2. Theory of image classification<br>3. Classification rules<br>4. Image classification procedure |
| Microwave sensors | 2 | 1. Microwave<br>2. Microwave sensors<br>3. Real Aperture Radar (RAR)<br>4. Synthetic Aperture Radar (SAR)<br>5. Interferometric SAR<br>6. Differential Interferometric SAR |
| Laser data | 2 | 1. Statistical processing of point clouds<br>2. Three-dimensional modeling using terrestrial laser data<br>3. Three-dimensional modeling using airborne laser data |
| Image processing 3 | 1 | 1. Edge extraction<br>2. Segmentation<br>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 2nd

【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 |
|---|---|---|

【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】Tue 1st

【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 |
|---|---|---|

【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】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】

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】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693287

# Disaster Information Management

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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

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】 【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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】Fri 1st

【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】

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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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】

10A420

# Lecture on Exploration Geophysics

探査工学特論

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

【Location】C1-117 【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】

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.
【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.

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 |
|---|---|---|

【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】C1-171 【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 | 1 | |
| 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】【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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

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】

【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 first lecture.

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

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

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

【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】2nd floor conference room, UPL karasuma office 【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, JongJin Yoon

【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】2nd floor conference room, UPL karasuma office 【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, and Tetsuharu Oba

【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】

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】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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, and Tetsuharu Oba

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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, and Tetsuharu Oba

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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 |
|---|---|---|

【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 | |

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 | |

【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 | |

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【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 |
|---|---|---|

【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 |
|---|---|---|

【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】Thu 1st

【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 |
|---|---|---|

【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 Course 【Term】2nd term 【Class day & Period】Wed 5th

【Location】C1-172 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】

【Course Description】

【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 |
|---|---|---|

【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)】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】

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】 【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】

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】C1-171

【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 | |
| | 3 | |
| | 3 | |
| | 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】

10D053

# Science & Technology ” International Leadership

科学技術国際リーダーシップ論

【Code】10D053 【Course Year】Master and 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】

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 | 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).

10D052

# Frontrunners in Science and Technology

21 世紀を切り拓く科学技術 ( ﾌﾛﾝﾄﾗﾝﾅｰ講座 )

【Code】10D052 【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)】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】

10B014

# Theory of Architectural and Environmental Planning 1

建築環境計画論Ⅰ

【Code】10B014 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Thu 2nd

【Location】C2-213 【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】

10B017

# History of Architecture and Environmental Design

建築都市文化史学特論

【Code】10B017 【Course Year】【Term】1st term 【Class day & Period】【Location】【Credits】【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】

10B027

# Architectural Information Systems, Adv.

建築情報システム学特論

【Code】10B027 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 1st

【Location】C2-213 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Naoki Katoh, Makoto Ohsaki

【Course Description】We will teach theory and methodology to model the design process of an architecture and to carry out planning, analysis, design, production and and management. For this, we will teach the system engineering methodology such as system analysis method, optimization theory, and heuristics approach, and data analysis methodology such as data mining. We will give assignments which require to use computer software.

【Grading】It is based on the attendance of class, and on reports.

【Course Goals】The goal is to make students to acquire the knowledge of system engineering methods such as optimization theory and data analysis and to apply the knowledge to solve real problems.

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|
| What is optimization method? | 1 | We will give a brief overview about the fundamental concepts. |
| linear programming, network programming | 3~4 | We will give lectures about inear programming and network programming by focusing on how to model real problems as linear and network problems. We will teach how to use linear programming software. |
| integer programming, approximation method | 3 | We will introduce problems that can be modeled as integer programs by giving applications to architectural problems. We will also teach how to use software for solving integer programs. |
| location theory | 2 | We will teach what is location theory and mention several applications in urban design. |
| data mining | 4 | Among method for knowledge discovery from huge amount of data, we will teach association rules, decision trees, clustering, and multiple regression analysis. We will give assignment which require to use data mining software called Weka. |
| computational geometry and GIS | 2 | We will teach what are computational geometry and GIS and mention applications to architecture. |

【Textbook】Introduction to architectural Systems, Naoki Katoh, Makoto Ohsaki, Akinori Tani, Kyoritsu Shuppan (in Japanese).

【Textbook(supplemental)】Mathematical Programming, Naoki Katoh, Corona Sha (in Japanese). Data mining and its Applications, Naoki Katoh, Yukinobu Hamuro, Katsutoshi Yada, Asakura Shoten (in Japanese).

【Prerequisite(s)】linear algebra, calculus, probability theory

【Web Sites】

【Additional Information】

10B026

# Construction Engineering and Management

建築生産特論

【Code】10B026 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 5th

【Location】C2-101 【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B037

# Design Mechanics for Building Structures

建築設計力学

【Code】10B037 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 1st 【Location】C2-213

【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】I. Takewaki, M. Tsuji

【Course Description】Basic mechanics and inverse problem for design of building structures are explained. Structural optimization methods are also presented. Rational structural design approaches are introduced in place of conventional try-and-error approaches.

【Grading】Grading is based on the examination at the end of semester.

【Course Goals】Obtain the knowledge on basic mechanics for design of building structures. Also obtain advanced knowledges on new theories and methodologies of structural optimization and inverse-problem formulations.

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|
| Fundamentals of mathematical programming | 2 | Fundamentals of mathematical programming methods are explained. Linear and nonlinear programming methods are introduced and some examples are presented. |
| Design sensitivity analysis | 1 | Basic methods of sensitivity analysis for computing derivatives (sensitivity coefficients) of static responses and frequencies of free vibration with respect to vatiations of design parameters, shape sensitivity analysis with respect to nodal |
| Application to optimization of framed structures | 1 | Application of mathematical programming methods to optimization of framed structures is presented. |
| Earthquake response constrained design | 1 | Design earthquakes defined in response spectrum and earthquake response constrained design for shear building models |
| Earthquake response constrained design for response controlled | 1 | Earthquake response constrained design for response controlled structures and isolated structures including the design of control devices. |
| Exercise 1 | 1 | Exercise on simple structural optimization problem. |
| Concept of inverse problem | 1 | Examples of inverse problem in terms of shear building models |
| Hybrid inverse problem of structural systems | 1 | Examples of hybrid inverse problem in vibration and classification of hybrid inverse problems. The solution procedure of hybrid inverse mode problems is discussed. |
| Strain-controlled design method for moment-resisting frames | 1 | Simple examples are used for understanding fundamental concepts of strain-controlled design. |
| Inverse problem via design sensitivity analysis | 1 | An inverse problem formulation via design sensitivity analysis (direct method) is explained. |
| Earthquake-response constrained design | 1 | A method of earthquake-response constrained design for shear building models is explained. Design loads in terms of the design response spectrum are used in the design method. |
| Performance-based Design | 1 | A design methodology based on the concept of performance-based design is explained. |
| Exercise 2 | 1 | Exercise on inverse problems. |

【Textbook】

【Textbook(supplemental)】Design Mechanics and Control Dynamics of Building, Architectural Institute of Japan, 1994.

【Prerequisite(s)】Mechanics of Building Structures, Basic Linear Algebra, Basic Calculus

【Web Sites】

【Additional Information】

10B231

# High Performance Structural Systems Engineering

高性能構造工学

【Code】10B231 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 2nd

【Location】C2-313 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Masayoshi Nakashima, Keiichiro Suita

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|
| | 1 | |
| | 2 | |
| | 2 | |
| | 4 | |
| | 3 | |
| | 1 | |

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B034

# Applied Solid Mechanics

応用固体力学

【Code】10B034 【Course Year】Master 1st 【Term】1st term 【Class day & Period】 【Location】C2-313

【Credits】4 【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】

10B222

# Environmental Control Engineering, Adv.

環境制御工学特論

【Code】10B222 【Course Year】Master Course 【Term】1st term 【Class day & Period】Mon 2nd

【Location】C2-413 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Kazunori HARADA, Shuichi HOKOI

【Course Description】This lecture deals with fundamental aspects on functional aspects of building envelope as a shelter from outdoor climate. Specifically, the detailed methods on air flow, thermal radiation and indoor air quality are described and discussed for use in practice of building design for thermal environment control and safety problems during fire.

【Grading】['Score is evaluated by end-term examination.', 'Score is evaluated by end-term examination.']

【Course Goals】To acquire basic concepts on fundamental concepts on thermal environment control for preparation of master thesis development.

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|
| introduction | 2 | The history of numerical methods in architectural environmental control is briefly introduced, followed by introduction of mathematical formulation of physical phenomena. |
| numerical methods in heat conduction | 4 | As a common knowledge, heat conduction equation is dealt with in order to understand the basic framework in numerical methods. At the end of this term, report will be obligatory to understand the meaning of discrete equations and their nature. |
| numerical methods on fluid motion | 5 | Lecture will be given for standard methods of calculation of fluid dynamics. At the end of this term, simple practice on control volume method and SIMPLE algorithm will be obligatory. |
| simultaneous system and turbulence | 2 | Lecture will be given for simultaneous systems of fluid motion and thermal field. In a similar way, turbulence model is to be introduced. The participants are expected to have learned on environmental engineering in architecture at bachelor level. |

【Textbook】None specified.

【Textbook(supplemental)】To be directed during the course.

【Prerequisite(s)】The participants are expected to have learned on environmental engineering in architecture at bachelor level.

【Web Sites】

【Additional Information】

10B024

# Theory of Architecture and Environment Design, Adv.

生活空間学特論

【Code】10B024 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Wed 4th

【Location】C2-213 【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】

10B015

# Theory of Architectural and Environmental Planning II

建築環境計画論II

【Code】10B015 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Thu 1st 【Location】C2-213 【Credits】2【Restriction】No Restriction【Lecture Form(s)】Lecture【Language】Japanese【Instructor】Tetsu YOSHIDA

【Course Description】In theory of human psychology and behavior in built-environment, how privacy is and was dealt in architectural planning and urban planning is explained. Especially about formation of privacy feeling after territorial behavior or owing to others sight line is mainly explained too. Furthermore, through field survey and presentation, understanding about subject matter will be enriched.

【Grading】Presentation in class - 50% (marked after submission of report after presentation) Report at end of period - 50 %

【Course Goals】Enriching understanding about privacy dealt in architectural and urban planning field

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|
| privacy in architectural and urban planning | 1 | Explain outline how privacy is dealt in architectural and urban planning |
| Privacy dealt in mass medium and data privacy, and privacy in assessment of dwelling environment | 1 | Firstly classification of privacy is presented. And Privacy dealt in mass medium and data privacy, and privacy in assessment of dwelling environment is explained. |
| Privacy between members in family | 1 | Privacy between members in family in one house which began to be considered after the modern Enlightenment in Europe is explained |
| Privacy dealt in houses rebuilt by successively in built-up area | 1 | That privacy dealt in houses when they are rebuilt by successively in built-up area has begun to be indispensable is explained. |
| Privacy dealt with sunshine condition and open space condition | 1 | Privacy dealt with sunshine condition and open space condition especially in urban planning is explained |
| Privacy after possession of territory | 1 | Formation of privacy feeling after possession of territory explained by proxemics theory is explained |
| Privacy dealt after comparing windows of houses and buildings to eyes | 3 | Formation of privacy feeling after comparing windows of houses and buildings to ones' eyes is explained |
| Crime prevention, Fear of crime | 2 | CPTED concepts besed on possession of territory and fear of crime is explained. |
| Presentation by students | 3 | In addition to knowledge got from lecture, based on field survey and so on, presentation by students |

【Textbook】

【Textbook(supplemental)】Distributed hand-out at lectures

【Prerequisite(s)】General knowledge about proxemics theory

【Web Sites】

【Additional Information】

10B035

# Design Theory of Architecture and Human Environment

人間生活環境デザイン論

【Code】10B035 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 2nd

【Location】C2-213 【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】

10B036

# History of Japanese Architecture

建築史学特論

【Code】10B036 【Course Year】 【Term】2nd term 【Class day & Period】 【Location】 【Credits】

【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】

10B013

# Theory of Architectural Design, Adv.

建築設計特論

【Code】10B013 【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】

10B016

# Theory of Architecture, Adv.

建築論特論

【Code】10B016 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 3rd

【Location】C2-213 【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】

10B019

# Building construction project management

建築プロジェクトマネジメント論

【Code】10B019 【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B038

# Theory of Cognition in Architecture and Human Environment

人間生活環境認知論

【Code】10B038 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Wed 2nd

【Location】C2-413 【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】

10B040

# Advanced Structural Analysis

構造解析学特論

【Code】10B040 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Wed 3rd

【Location】C2-313 【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】

10B043

# Concrete Structures, Advanced

コンクリート系構造特論

【Code】10B043 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Wed 2nd

【Location】C2-313 【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】

10B044

# Earthquake Resistant Structures, Adv.

耐震構造特論

【Code】10B044 【Course Year】Master 1st 【Term】2nd term 【Class day & Period】Thu 1st

【Location】C2-313 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese

【Instructor】Minehiro Nishiyama, Hitoshi Tanaka, Susumu Kono

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|
| Lessons from the previous earthquakes | 1 | Typical damages and their causes in the earthquakes in 1990s and 2000s are discussed. |
| Seismic design using the capacity design concept | 4 | Seismic design using the capacity design concept are discussed. The topics are "Essentials of structural systems","Definition of design quantities", and "Philogophy of capacity design". |

【Textbook】

【Textbook(supplemental)】Some chapters from "Seimic Design of Reinforced Concrete and Masonry Buildings" by Paulay and Priestley will be distributed for reference.

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B234

# Steel Structures, Advanced

鋼構造特論

【Code】10B234 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Wed 4th

【Location】C2-313 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Keiichiro Suita

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

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

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B052

# Control for Structural Safety

構造安全制御

【Code】10B052 【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】

10B046

# Dynamic Response of Building Structures

建築振動論

【Code】10B046 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 4th

【Location】C2-313 【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B240

# Urban Disaster Mitigation Engineering

都市防災工学

【Code】10B240 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 3rd

【Location】C2-313 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Hiroshi Kawase, Shiichi Matsushima

【Course Description】The natural disaster to urban society is getting complex and difficult to predict along with the density growth and high performance build-up, and so the risk of the disaster has risen more and more in recent years. Therefore, the necessity of the integrated disaster mitigation measures before the disaster, immediately after the disaster, and long after the disaster is pointed out. In this lecture, we provide the lessens learned from earthquake disaster in the past, prediction methods of strong motions and building damages, earthquake-proof performance evaluation technique in a real building, and a pros and cons of the present building code for the disaster mitigation.

【Grading】Grading will be based on the attendance, report, and small exams.

【Course Goals】Understand the seismic vulnerability evaluation of structures and urban systems, the disaster impact evaluation scheme, and the disaster prevention countermeasures, and learn basic knowledge needed to foresee and prepare for the earthquake disaster in future.

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|
| Earthquake Mechanism | 4 | Source mechanisms for disastrous earthquakes |
| Wave propagation | 3 | Wave propagation analysis and strong motion simulation |
| Structural response | 3 | Modeling of structures and prediction of their responses |
| Great eartuquake disaster | 3 | Predictions of great earthquake disaster and its environmental impact |
| Seismic design and retrofit | 2 | Problems associated with the current building code and retrofitting technology |

【Textbook】

【Textbook(supplemental)】Ground motion, phenomena and theory(AIJ)

【Prerequisite(s)】Basic knowledge of seismic design

【Web Sites】

【Additional Information】

10B238

# Environmental Wind Engineering

建築風工学

【Code】10B238 【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】

10B069

# Architectural Engineer Ethics

建築技術者倫理

【Code】10B069 【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】

10B054

# Building Systems

建築設備システム特論

【Code】10B054 【Course Year】Master Course 【Term】2nd term 【Class day & Period】 【Location】C2-413

【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 | |
| | 6 | |

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B226

# Building Geoenvironment Engineering

建築地盤工学

【Code】10B226 【Course Year】Master Course 【Term】1st term 【Class day & Period】Fri 1st 【Location】C1-172 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture 【Language】Japanese 【Instructor】I.Takewaki, M.Tsuji

【Course Description】Wave propagation theories are explained first for 1D, 2D and 3D models. 1D multi-reflection problems of waves are also formulated and explained. Based on these theories, methods for construction of design earthquake ground motions are presented. Soil-structure interaction problems are stated finally for the purpose of developing more rational design methods for building structures.

【Grading】Evaluated by the term examination at the end of the semester.

【Course Goals】Obtain the knowledge on wave propagation theories and 1D multi-reflection theory of waves. Furthermore obtain the knowledge on construction of design earthquake ground motions and soil-structure interaction.

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|
| Introduction and in-situ (field) tests | 1 | Introduction of course is conducted and in-situ (field) tests are explained. |
| Wave propagation 1 (one-dimensional wave propagation 1) | 1 | 1D wave propagation problems are formulated and explained from its fundamentals. |
| Wave propagation 2 (one-dimensional wave propagation 2) | 1 | 1D multi-reflection problems of waves are formulated and explained. The introduction of the program of SHAKE is also made. |
| Wave propagation 3 (2D and 3D wave propagation 1) | 1 | 3D wave propagation problems are formulated and explained. |
| Wave propagation 4 (2D and 3D wave propagation 2) | 1 | 2D wave propagation problems are formulated and explained as the simplification of 3D problems. |
| Wave propagation 5 (2D and 3D wave propagation 3) | 1 | Surface waves (Rayleigh and Love waves) are explained from its fundamentals. |
| Exercise on wave propagation | 1 | Exercise on wave propagation is conducted. 1D, 2D wave propagations are treated. |
| Construction of design earthquake ground motions | 1 | Construction of design earthquake ground motions is discussed. Response spectrum, Fourier spectrum and power spectrum are also discussed from the viewpoint of construction of design earthquake ground motions. |
| Soil-structure interaction | 2 | The problem of soil-structure interaction is explained and various models for this problem are introduced. |
| Exercise on structural design considering soil-structure interaction | 1 | Exercise on structural design considering soil-structure interaction is conducted. |
| Seismic damage to soil, pile and foundation | 1 | Seismic damage to soil, pile and foundation is explained. |
| Seismic upgrading (structures) | 1 | Seismic upgrading (structures) is discussed. |
| Seismic upgrading (soil, pile and foundation) | 1 | Seismic upgrading (soil, pile and foundation) is discussed. |

【Textbook】

【Textbook(supplemental)】Suggest in the class.

【Prerequisite(s)】Basics of mechanics. Fundamentals of vibration and wave propagation. Preliminary of linear algebra and calculus.

【Web Sites】

【Additional Information】

10A832

# Theory of Structural Materials, Adv.

構造材料特論

【Code】10A832 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 3rd

【Location】C1-191 【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】

10F433

# Design of Acoustic Environment

音環境設計論

【Code】10F433 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 1st

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

【Instructor】Prof. Hirotsugu Takahashi

【Course Description】The aim of this lecture is the acquisition of the theory and technology regarding acoustics, which are needed in designing optimum acoustic environment for our living space in the complex urban society. To achieve good urban environment having less stresses in both physiological and psychological aspects, it is important to optimize the parameters regarding this factor. The education programs for this aim are the lecture of the conception for acoustic environment of human space, acoustic theory and technology for noise and vibration control stressing physical nature based on human science.

【Grading】The learning results are evaluated overall in terms of both the record of attendance and the final exam.

【Course Goals】The goal of this lecture is better understanding of the theory and technology regarding acoustics, which are needed in designing optimum acoustic environment for our living space in the complex urban society.

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|
| Introduction | 1 | Explanation of outline of the lecture and the method for evaluation of the learning results |
| Fundamentals of acoustic design | 4 | Explanation of fundamentals of sound and vibration, propagation of acoustic energy and sound radiation problems, which are necessary to understand the physical phenomena of various acoustic problems |
| Noise and vibration problems in buildings | 4 | Lectures of physical phenomena and method of measures and evaluation method for various acoustic problems in buildings, The problems are air-borne and structure-borne sound, sound insulation, floor impact sound, duct noise, and so on |
| Room acoustics | 3 | Lectures of method of analysis, measuring techniques and evaluation of acoustics in the room in order to control and optimize the acoustic environment of the room |
| Update topics of acoustic problems | 1 | Lectures of update topics regarding the problem of noise, vibration and room acoustics |

【Textbook】Distribution of the lecture materials

【Textbook(supplemental)】Introduced if necessary

【Prerequisite(s)】Fundamentals of Dynamics, Differential and Integration

【Web Sites】http://ae-gate1.archi.kyoto-u.ac.jp/

【Additional Information】

10F437

# Urban Fire Hazard Mitigation and Safety Planning

都市火災安全計画論

【Code】10F437 【Course Year】Master Course 【Term】1st term 【Class day & Period】Tue 2nd

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

【Instructor】TANAKA Takeyoshi, HARADA Kazunori

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|
| introduction | 1 | |
| Urban fire and Kyoto | 1 | |
| Fire provisions in Edo-era | 2 | |
| Urban fires after Meiji-era | 1 | |
| Seismic fire | 2 | |
| Fire provision and city planning of Tokyo | 2 | |
| Post war reestablishment and urba fire plan | 1 | |
| fire characteristics of individual buildings | 4 | Basic knowledge on fire characteristics of individual buildings are lectured as a context of elements in urban unit. Essential provisions for individual buildings are summarized. |

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10A856

# Dwelling Planning

居住空間計画学

【Code】10A856 【Course Year】Master Course 【Term】1st term 【Class day & Period】Wed 3rd

【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F431

# Integration of Research and Architectural Design

臨床建築学

【Code】10F431 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Fri 4th

【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B255

# Foundation Design and Construction

建築基礎構造設計・施工論

【Code】10B255 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 2nd

【Location】C2-313 【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 | |
| | 2 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 2 | |
| | 1 | |
| | 2 | |
| | 1 | |

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10F435

# Social Acoustics

社会音響学

【Code】10F435 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 3rd 【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】

10B257

# Control Method in Built Environment

建築環境調整学

【Code】10B257 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】C2-101 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】Japanese

【Instructor】Uetani, Yoshiaki

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

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

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

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】 【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693431

力学系理論特論

【Code】693431 【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】

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】

10i017

# Architecture Communication

建築学コミュニケーション（専門英語）

【Code】10i017 【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】

10M035

# Construction of Environment

環境構築論

【Code】10M035 【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】

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 | 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).

10B055

# Exercise in Architecture and Architectural Engineering, A

建築学総合演習A

【Code】10B055【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】

10B056

# Exercise in Architecture and Architectural Engineering, B

建築学総合演習Ｂ

【Code】10B056【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】

10B057

# Exercise in Architecture and Architectural Engineering, C

建築学総合演習Ｃ

【Code】10B057【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】

10B058

# Exercise in Architecture and Architectural Engineering, D

建築学総合演習D

【Code】10B058【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】

10B059

# Exercise in Architecture and Architectural Engineering, E

建築学総合演習 E

【Code】10B059【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】

10B060

# Exercise in Architecture and Architectural Engineering, F

建築学総合演習 F

【Code】10B060【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】

10B061

# Exercise in Architecture and Architectural Engineering, G

建築学総合演習Ｇ

【Code】10B061【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】

10B064

# Exercise in Architecture and Architectural Engineering, H

建築学総合演習H

【Code】10B064 【Course Year】 【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】

10B065

# Exercise in Architecture and Architectural Engineering, I

建築学総合演習 I

【Code】10B065【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】

10B070

# Exercises in Architecture and Architectural Engineering, J

建築学総合演習 J

【Code】10B070 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

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

【Instructor】Professors in Sustainable Built-Environmental Engineering

【Course Description】Survey and practice will be carried out on energy and carbon reduction, pitfall disaster mitigation in gray zone area between urban space and buildings, environmental control by using natural and renewable energy. Discussions will be held among professors and students on corresponding research topics. Participants are required to make presentations and report.

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B083

# Exercises in Architecture and Architectural Engineering, K

建築学総合演習 K

【Code】10B083 【Course Year】Master Course 【Term】1st+2nd term 【Class day & Period】 【Location】

【Credits】4 【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】

10B084

# Exercises in Architecture and Architectural Engineering, L

建築学総合演習 L

【Code】10B084【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】

10B085

# Exercises in Architecture and Architectural Engineering, M

建築学総合演習 M

【Code】10B085【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】

10B062

# Seminar on Architecture and Architectural Engineering, I

建築学特別演習Ⅰ

【Code】10B062【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】

10B063

# Seminar on Architecture and Architectural Engineering, II

建築学特別演習 II

【Code】10B063【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】

10B071

# Internship Ⅰ, Architectural Design Practice

インターンシップⅠ（建築）

【Code】10B071【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】

10B073

# Internship Ⅱ, Architectural Design Practice

インターンシップⅡ（建築）

【Code】10B073【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】

10B075

# Architectural Design Practice

建築設計実習

【Code】10B075 【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】

10B077

# Architecture Design Studio Ⅰ

建築設計演習Ⅰ

【Code】10B077 【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】

10B079

# Architecture Design Studio Ⅱ

建築設計演習Ⅱ

【Code】10B079 【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】

10B081

# Architectural Construction Control Practice

建築工事監理実習

【Code】10B081 【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】

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】

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】

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】【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】

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】

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】 【Credits】2 【Restriction】 【Lecture Form(s)】Relay 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】

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 | |
| | 1-2 | |
| | 1-2 | |

【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 |
|---|---|---|

【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】【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】

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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 | |
| | 4 | |

【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693510

機械システム制御論

【Code】693510 【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】

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】【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】

693518

共生システム論

【Code】693518 【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】

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】 【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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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】Wed 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 |
|---|---|---|

【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】

10B807

# Manufacturing Systems Engineering

生産システム工学

【Code】10B807 【Course Year】Master 1st 【Term】1st term 【Class day & Period】Fri 3rd

【Location】Engineering Science Depts Bldg.-212 【Credits】2 【Restriction】No Restriction

【Lecture Form(s)】Lecture 【Language】Japanese 【Instructor】Hajime Mizuyama

【Course Description】Primary competing factors of a manufacturing system, that is, quality, cost and delivery and how to manage these factors will be discussed. Modern approaches to designing in good quality and low cost will be especially emphasized. Further, if time allows, how to manage a manufacturing system including multiple decision makers, such as a supply chain and a production network, will be also dealt with.

【Grading】Personal assignments, group-work results and the end-term examination are taken into account.

【Course Goals】To become able to discuss with one's own vocabulary how quality management, cost management and production management should be performed in today’s changing market environment.

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|
| Manufacturing systems and their competitiveness | 1 | |
| Product quality differentiation | 3 | |
| Robust design of products and processes | 3 | |
| Cost management and target costing | 1 | |
| Design for manufacturing and assembly | 3 | |
| Supply chain and production network management | 3 | |

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】Basic knowledge on applied statistics (especially, design of experiments) and production costs is required. Elemental knowledge on decision science and game theory will be also helpful (but is not mandatory).

【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】 【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】

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 | |
| | 2 | |
| | 2 | |
| | 2 | |
| | 1 | |
| | 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 |
|---|---|---|

【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10B828

# High Precision Engineering

超精密工学

【Code】10B828 【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】

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 |
|---|---|---|

【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 5th

【Location】Engineering Science Depts Bldg.-216 【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】

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 |
|---|---|---|

【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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【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 |
|---|---|---|

【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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

653322

燃焼理工学

【Code】653322 【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】

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】

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 |
|---|---|---|

【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693431

力学系理論特論

【Code】693431 【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】

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】

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】

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】

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】【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】

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】【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】

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.<br>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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【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 |
|---|---|---|

【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】 【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】

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 | |
| | 2 | |
| | 2 | |
| | 2 | |
| | 1 | |
| | 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 |
|---|---|---|

【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 |
|---|---|---|

【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, ultrasonic devices, etc, are also introduced.

【Grading】Grading will be based on the attendance as well as paper examinations (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 learning about technological applications of ultrasound in a variety of fields extending from microdevices to macrosystems. Particular emphasis is put on the sound understanding 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 | 2 | Expressions of stress and strain; Conservation laws; Stress-strain relations; Hamilton's principle, Love's theory for longitudinal waves in a bar. |
| Waves in isotropic elastic media | 1 | Contracted notation; 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. |
| 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 | 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 of ultrasound energy; Ultrasonic devices. |

【Textbook】No textbooks are assigned. The lecture is mainly given in a blackboard style. Print-outs are handed in in the lecture 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 of the above items are subject to change according to each year's schedule.

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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【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.

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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693410

数理解析特論

【Code】693410 【Course Year】 【Term】2nd term 【Class day & Period】Wed 3rd 【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】

10G011

# Design and Manufacturing Engineering

設計生産論

【Code】10G011 【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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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】

【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】

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 |
|---|---|---|

【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

693431

力学系理論特論

【Code】693431 【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】

10D052

# Frontrunners in Science and Technology

21 世紀を切り拓く科学技術 ( ﾌﾛﾝﾄﾗﾝﾅｰ講座 )

【Code】10D052 【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)】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】

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】

【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】

10D053

# Science & Technology” International Leadership

科学技術国際リーダーシップ論

【Code】10D053 【Course Year】Master and 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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 | 6 | |
| Plasma MHD | 6 | |

【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 |
|---|---|---|
| | 12-13 | |

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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 | 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】 【Credits】2 【Restriction】 【Lecture Form(s)】Relay 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】

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 | 5 | 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】

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 |
|---|---|---|

【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 | 1 | |
| Physics in radiation diagnosis | 2-3 | |
| Physics in radiation therapy | 3-4 | |
| 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.

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】

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 |
|---|---|---|

【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 |
|---|---|---|

【Textbook】

【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【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】

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 16, 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】

10D052

# Frontrunners in Science and Technology

21 世紀を切り拓く科学技術 ( ﾌﾛﾝﾄﾗﾝﾅｰ講座 )

【Code】10D052 【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)】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】

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】

10C206

# Thermodynamics for Materials Science, Adv. B

材料熱力学特論Ｂ

【Code】10C206 【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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C295

# Integrated Materials Science III

統合材料科学III

【Code】10C295 【Course Year】Master and Doctor Course 【Term】2nd 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】

10C293

# Integrated Molecular Science III

統合物質科学III

【Code】10C293 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd 【Location】Faculty of Science Bldg.No.6-302【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 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【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 | 2 | 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.

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<br>2. Quantum interference between electrons and its influence on electronic conduction<br>3. Ballistic conduction<br>4. Single-electron tunneling<br>5. Electron transport through atom-sized contacts of metals<br>6. Electron transport through single molecules<br>7. Newest topics of mesoscopic electronic conduction |
| Materials characterization with SPM | 8 | 1. Atomic and electronic structures of surfaces<br>2. Properties of tunneling electrons<br>4. Forces acting across ultrasmall junctions<br>5. Materials characterization with SPM (1)<br>6. Materials characterization with SPM (2)<br>7. Materials characterization with SPM (3)<br>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】

10C259

# Random Structure Materials

ランダム構造物質学特論

【Code】10C259 【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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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】 【Credits】2 【Restriction】 【Lecture Form(s)】Relay 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】

10C237

# New Materials, Adv.

新素材特論

【Code】10C237 【Course Year】Master Course 【Term】2nd term 【Class day & Period】

【Location】Integrated Research Bldg.-111 【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】

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 | |

【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 16, 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 | 6 | 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 |
|---|---|---|

【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】【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】

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】

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 | fundamentals of state equations, their relationship to transfer functions and block diagram representations |
| responses of linear systems | 5 | state transition matrices, equivalence transformation of systems, mode decomposition and Lyapunov stability |
| controllability and observability | 5 | 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 rating is in principle based on an exam.

【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 | local search, basic ideas of meta-heuristics, genetic algorithms, simulated annealing method, and tabu search |

【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, and linear algebra

【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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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<br>- Edge element for three-dimensional magnetic field analysis |
| Finite integration method for electromagnetic field analysis | 3-4 | - Introduction to finite integration method<br>- Application to electromagnetic field analysis |
| Introduction to special theory of relativity | 2-3 | - Galilean relativity and special relativity<br>- Lorentz transformation |
| Tensor representation and relativistic dynamics | 2-3 | - Introduction to tensor representation<br>- Relativistic dynamics |
| Covariant formulation of Maxwell’s equations | 2 | - Electromagnetic field tensor<br>- 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 3rd

【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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C621

# Applied Hybrid System Engineering

応用ハイブリッドシステム工学

【Code】10C621 【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】

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 |
|---|---|---|

【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 | 2-3 | 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】

【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 |
|---|---|---|
| | 7 | |
| | 3 | |
| | 4 | |

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【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 |
|---|---|---|

【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】Electrical Engineering Bldg.-Lecture Room (M) 【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】

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) /Remoto Lecture Room(Katsura Campus) 【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】

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】

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】【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】

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】

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】

10D052

# Frontrunners in Science and Technology

21 世紀を切り拓く科学技術 ( ﾌﾛﾝﾄﾗﾝﾅｰ講座 )

【Code】10D052 【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)】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】

10D053

# Science & Technology ” International Leadership

科学技術国際リーダーシップ論

【Code】10D053 【Course Year】Master and 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】

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 | 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 16, 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】

10i002

# Information and Communications Technology for Sustainable Society

ICT と持続性社会

【Code】10i002 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Thu 5th

【Location】Consultation Room for Students at Yoshida and Seminar Room at Katsura 【Credits】2 【Restriction】

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

【Instructor】Mr. Sone, Prof. Sawaragi, Senr Lect. Yamamoto, Senr Lect. Wada, and so on

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

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】【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】

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】

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 |
|---|---|---|

【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】Understand the details of an ion beam apparatus: generation, transport and evaluation of an ion beam. Understanding of the entire ion beam apparatus 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 roperties of ions in vacuum are given, and ion beam apparatuses and their application will be introduced with some typical examples. |
| Ion-solid interaction | 2 | 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 will be given. |
| Ion beam systems and vacuum pumping system | 1 | Cross sections for charge exchange and electron detachment, which are important for ion transportation, will be explained. Some introduction to vacuum technologies are given, pumping systems which are used for ion beam apparatuses are also explained. |
| Ion beam as a party of particles | 1 | Liouville's theorem which is applicable to ions of ion beam is explained. Some important parameters of ion beam, emittance, brightness, and energy spread are also presented. Finally, a concept of transfer matrix of ion optical element is presented. |
| Ion sources | 2 | Methods of ion generation are explained. Production of plasma for singly charged positive ions is presented. Some ion production methods with surface effect are also presented: surface ionization, intense field application, and secondary ion formation for negative ions. |
| Ion lenses | 1-2 | Electrostatic lens systems which is generally used for ion beam apparatuses are presented. Transfer matrices of the electrostatic lenses will be given. Some problems in accelerating and decelerating ion beams with electrostatic field will be presented. |
| Mass separators | 2-3 | Details of magnetic sector and wien filter as mass separator are given. Transfer matrices of these mass separator are presented and focusing effect of these mass separator is described. Finally, mass resolution will be given. |
| Deflection, scanning and current detection | 1 | Systems for ion beam deflection and scanning are explained. Structure and function of Faraday cup, which is generally used for ion current measurement is also presented. |

【Textbook】Yasuhito Gotoh, Charged Particle Beam Appratus, 2009 version (Will be sold at CO-OP shop)

【Textbook(supplemental)】Junzo Ishikawa, Charged Particle Engineering (Corona).

【Prerequisite(s)】Vacuum Electronic Engineering 1 (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 4th

【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. Additionaly, 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 souces and electromagnetic-wave porpagation in a plasma are required.

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|
| Fundamentals | 2 | 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 | 4-5 | 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 buchelor cource.

【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】

【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. |

【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 | |
| Superconductors | 4 | |
| Epitaxial growth | 3 | 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 |
|---|---|---|

【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】

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 |
|---|---|---|

【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】【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】

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 |
|---|---|---|

【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 |
|---|---|---|

【Textbook】

【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 |
|---|---|---|

【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 |
|---|---|---|

【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】【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】

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】

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】

10D052

# Frontrunners in Science and Technology

21 世紀を切り拓く科学技術 ( ﾌﾛﾝﾄﾗﾝﾅｰ講座 )

【Code】10D052 【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)】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】

10D053

# Science & Technology ” International Leadership

科学技術国際リーダーシップ論

【Code】10D053 【Course Year】Master and 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】

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 | 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 16, 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】

10i002

# Information and Communications Technology for Sustainable Society

ICT と持続性社会

【Code】10i002 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Thu 5th

【Location】Consultation Room for Students at Yoshida and Seminar Room at Katsura 【Credits】2 【Restriction】

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

【Instructor】Mr. Sone, Prof. Sawaragi, Senr Lect. Yamamoto, Senr Lect. Wada, and so on

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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 16, 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】 【Credits】2 【Restriction】 【Lecture Form(s)】Relay 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】

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 | 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).

10D052

# Frontrunners in Science and Technology

21 世紀を切り拓く科学技術 ( ﾌﾛﾝﾄﾗﾝﾅｰ講座 )

【Code】10D052 【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)】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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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】

10D053

# Science & Technology ” International Leadership

科学技術国際リーダーシップ論

【Code】10D053 【Course Year】Master and 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】

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】

10C295

# Integrated Materials Science III

統合材料科学III

【Code】10C295 【Course Year】Master and Doctor Course 【Term】2nd 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】

10C293

# Integrated Molecular Science III

統合物質科学III

【Code】10C293 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd 【Location】Faculty of Science Bldg.No.6-302 【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 | |
| | 1 | |
| | 1 | |
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| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |

【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】2nd term 【Class day & Period】Fri 2nd

【Location】A2-303 【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 | |
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| | 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 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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|
| | 1 | |
| | 1 | |
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| | 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】2nd term 【Class day & Period】Mon 2nd 【Location】A2-303 【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】

10D210

# Chemistry of Organometallic Complexes

有機錯体化学

【Code】10D210 【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)】 【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<br>Application<br>Research trends<br>Zaise salt<br>Grignard reagent<br>Alkyl lithium<br>Ferrocene |
| General properties of transition metal organometallic complexes (1) | 1 | Ziegler catalyst<br>Hydroboration<br>Wittig reaction<br>Serendipity |
| General properties of transition metal organometallic complexes (2) | 1 | Bonding<br>Structure in general<br>Coordination number<br>η -Structure<br>μ -Structure |
| General properties of transition metal organometallic complexes (3) | 1 | Number of d- and s-electrons<br>Classification and the nature of ligands<br>Effect of complexation<br>Formal charge<br>Electron counting<br>18-electron rule<br>Oxidation state |
| Reactivity of transition metal organometallic compounds (1) | 1 | Oxidative addition<br>Reductive elimination |
| Reactivity of transition metal organometallic compounds (2) | 1 | Insertion reaction<br>Direct attack to the ligand<br>Other reactivities |
| Homogeneous catalysis (1) | 1 | Monsanto's acetic acid process<br>Hydroformylation<br>Hydrosilylation<br>Hydrocyanation<br>Polymerization |
| Homogeneous catalysis (2) | 1 | Wacker process<br>Various cross-coupling reaction<br>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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D226

# Chemistry of Well-Defined Catalysts

錯体触媒設計学

【Code】10D226 【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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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】2nd term 【Class day & Period】Wed 2nd

【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 |
|---|---|---|
| | 1 | |
| | 1 | |
| | 2 | |
| | 2 | |
| | 2 | |
| | 1 | |
| | 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】 【Term】1st term 【Class day & Period】Wed 2nd 【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 |
|---|---|---|

【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】1st term 【Class day & Period】Wed 2nd

【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】

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】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 |
|---|---|---|

【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】A1-001

【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 | |
| | 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)】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 16, 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】 【Credits】2 【Restriction】 【Lecture Form(s)】Relay 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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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】

10D053

# Science & Technology ” International Leadership

科学技術国際リーダーシップ論

【Code】10D053 【Course Year】Master and 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】

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 | 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).

10D052

# Frontrunners in Science and Technology

21 世紀を切り拓く科学技術 ( ﾌﾛﾝﾄﾗﾝﾅｰ講座 )

【Code】10D052 【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)】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】

10C295

# Integrated Materials Science III

統合材料科学III

【Code】10C295 【Course Year】Master and Doctor Course 【Term】2nd 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】

10C293

# Integrated Molecular Science III

統合物質科学III

【Code】10C293 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd 【Location】Faculty of Science Bldg.No.6-302 【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 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |

【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】

10D041

# Organotransition Metal Chemistry 1

有機金属化学 1

【Code】10D041 【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】

10D042

# Organotransition Metal Chemistry 2

有機金属化学２

【Code】10D042 【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】

10D818

# Advanced Organic Chemistry

先端有機化学

【Code】10D818 【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】

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 | |
| | 1 | |
| | 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 |
|---|---|---|

【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 |
|---|---|---|

【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】

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 |
|---|---|---|

【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】

10D422

# Molecular Materials Science

分子材料科学

【Code】10D422 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 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】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 |
|---|---|---|

【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】2F Seminar Room, Training Center for Industrial Instructors, Uji Campus 【Credits】2

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

【Instructor】H. Watanabe & Y. Masubuchi

【Course Description】Lectures on rheology and dynamics of polymeric liquids and their molecular basis

【Grading】Mainly by 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 | 1 | 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 | 1 | 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 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 16, 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】 【Credits】2 【Restriction】 【Lecture Form(s)】Relay 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】

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 | 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 |
|---|---|---|

【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 |
|---|---|---|

【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】

10D052

# Frontrunners in Science and Technology

21 世紀を切り拓く科学技術 ( ﾌﾛﾝﾄﾗﾝﾅｰ講座 )

【Code】10D052 【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)】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】

10D053

# Science & Technology ” International Leadership

科学技術国際リーダーシップ論

【Code】10D053 【Course Year】Master and 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】

10C295

# Integrated Materials Science III

統合材料科学III

【Code】10C295 【Course Year】Master and Doctor Course 【Term】2nd 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】

10C293

# Integrated Molecular Science III

統合物質科学III

【Code】10C293 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd 【Location】Faculty of Science Bldg.No.6-302【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 | |
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【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 |
|---|---|---|

【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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10D645

# Polymer Functional Chemistry

高分子機能化学

【Code】10D645 【Course Year】Master Course 【Term】1st 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 |
|---|---|---|

【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】Wed 3rd

【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】

10D613

# Polymer Structure and Function

高分子機能学

【Code】10D613 【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】

10D616

# Polymer Supermolecular Structure

高分子集合体構造

【Code】10D616 【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】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 | 3 | 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 | 5 | 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】

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 |
|---|---|---|

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【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】Tue 3rd

【Location】ICR C-324【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】

10D628

# Design of Polymer Materials

高分子材料設計

【Code】10D628 【Course Year】Master Course 【Term】2nd term 【Class day & Period】Tue 2nd

【Location】ICR Seminar Room 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】Yoshinobu Tsujii, Kohji Ohno

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

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

【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】Tue 4th

【Location】ICR C-324【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】

10D633

# Biomaterials Science and Engineering

高分子医工学

【Code】10D633 【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 |
|---|---|---|

【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 |
|---|---|---|

【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 16, 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】 【Credits】2 【Restriction】 【Lecture Form(s)】Relay 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】

10C293

# Integrated Molecular Science III

統合物質科学III

【Code】10C293 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd 【Location】Faculty of Science Bldg.No.6-302 【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 | |
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【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C295

# Integrated Materials Science III

統合材料科学III

【Code】10C295 【Course Year】Master and Doctor Course 【Term】2nd 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】

10D041

# Organotransition Metal Chemistry 1

有機金属化学 1

【Code】10D041 【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】

10D042

# Organotransition Metal Chemistry 2

有機金属化学２

【Code】10D042 【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】

10D818

# Advanced Organic Chemistry

先端有機化学

【Code】10D818 【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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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】

10D052

# Frontrunners in Science and Technology

21 世紀を切り拓く科学技術 ( ﾌﾛﾝﾄﾗﾝﾅｰ講座 )

【Code】10D052 【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)】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】

10D053

# Science & Technology ” International Leadership

科学技術国際リーダーシップ論

【Code】10D053 【Course Year】Master and 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】

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 | 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).

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】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】

10D834

# Fine Synthetic Chemistry

精密合成化学

【Code】10D834 【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】

10D813

# Bioorganic Chemistry

生物有機化学

【Code】10D813 【Course Year】Master and Doctor Course 【Term】2nd 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】

10D812

# Molecular Biology

分子生物化学

【Code】10D812 【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】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】

10D818

# Advanced Organic Chemistry

先端有機化学

【Code】10D818 【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】

10D041

# Organotransition Metal Chemistry 1

有機金属化学 1

【Code】10D041 【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】

10D042

# Organotransition Metal Chemistry 2

有機金属化学２

【Code】10D042 【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】

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】Wed 1st

【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】

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】(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】

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】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】

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 16, 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】 【Credits】2 【Restriction】 【Lecture Form(s)】Relay 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】

10i024

# Frontier of Coordination chemistry

合成・生物化学の最前線

【Code】10i024 【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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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】

10D052

# Frontrunners in Science and Technology

21 世紀を切り拓く科学技術 ( ﾌﾛﾝﾄﾗﾝﾅｰ講座 )

【Code】10D052 【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)】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】

10D053

# Science & Technology ” International Leadership

科学技術国際リーダーシップ論

【Code】10D053 【Course Year】Master and 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】

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 | 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).

10C293

# Integrated Molecular Science III

統合物質科学III

【Code】10C293 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd 【Location】Faculty of Science Bldg.No.6-302 【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 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

10C295

# Integrated Materials Science III

統合材料科学III

【Code】10C295 【Course Year】Master and Doctor Course 【Term】2nd 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】

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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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 | 2 | 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 | 2 | 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】

10E010

# Advanced Process Systems Engineering

プロセスシステム論

【Code】10E010 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Tue 3rd

【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 |
|---|---|---|

【Textbook】

【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 phenomena that affect particle behavior in gases are theoretically explained. Furthermore, the control of the particle charging and its applications are lectured.

【Grading】Examination and reports

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|
| Particle properties and measurements | 3 | Mathematical description of particle diameter distribution, properties of functional fine particles and methods for measurement and analysis are explained. |
| Particle adhesion and dynamical analysis | 3 | Measurement methods for adhesion forces of particles and dynamical analysis method for collision and deformation are lectured. |
| Behavior of particles in airflow | 3 | Temporal and spatial distribution of deposition and reentrainment of fine particles in airflow are explained using a physical model and probability theory. In addition, complicated entrainment phenomena during particle collision are discussed. |
| Particle charging and control | 3 | Concept of particle charging and quantitative analysis method 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 method are explained. |

【Textbook】Distribution of lecture notes

【Textbook(supplemental)】

【Prerequisite(s)】Basic knowledge on powder technology and aerosol science in buchelor 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】

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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】A2-304 【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 | |
| | 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】

【Course Description】

【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】【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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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】Mon 1st

【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 |
|---|---|---|

【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 4th

【Location】A2-305 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】 【Language】Japanese

【Instructor】Taniguchi

【Course Description】

【Grading】

【Course Goals】

【Course Topics】

| Theme | Class number of times | Description |
|---|---|---|

【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 |
|---|---|---|

【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 |
|---|---|---|

【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】 【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】 【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】

10E045

# Reseach in Chemical Engineering I

化学工学特別実験及演習Ⅰ

【Code】10E045 【Course Year】Master Course 【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 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】

10E049

# Reseach in Chemical Engineering III

化学工学特別実験及演習III

【Code】10E049 【Course Year】Master Course 【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 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】

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 16, 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】 【Credits】2 【Restriction】 【Lecture Form(s)】Relay 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】

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 |
|---|---|---|

【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 |
|---|---|---|

【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】

10D053

# Science & Technology” International Leadership

科学技術国際リーダーシップ論

【Code】10D053 【Course Year】Master and 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】

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 | 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).

10D052

# Frontrunners in Science and Technology

21 世紀を切り拓く科学技術 ( ﾌﾛﾝﾄﾗﾝﾅｰ講座 )

【Code】10D052 【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)】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】

10C295

# Integrated Materials Science III

統合材料科学III

【Code】10C295 【Course Year】Master and Doctor Course 【Term】2nd 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】

10C293

# Integrated Molecular Science III

統合物質科学III

【Code】10C293 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Wed 2nd 【Location】Faculty of Science Bldg.No.6-302 【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 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |
| | 1 | |

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Web Sites】

【Additional Information】

**工学研究科シラバス 2010 年度版**
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〒 615-8530 京都市西京区京都大学桂

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デザイン　工学研究科附属情報センター

# 工学研究科シラバス 2010 年度版

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- [B] Master's Program
- [C] Interdisciplinary Engineering Course Program (5yr Course)
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- [E] Interdisciplinary Engineering Course Program (3yr Course)
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