SYLLABUS 2010

[A] Global Engineering

Kyoto University, Faculty of Engineering

[A] Global Engineering

Global Engineering

Exercises in InformaTion Processing Basics

Code   230100   Course Year   1st year   Term   1st term   Class day & Period   Location   Credits   1

Restriction   Lecture Form(s)   Seminar   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
	3	
	2	
	3	
	2	
	4	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

InTroducTion To Global Engineering

Code   30010   Course Year   1st year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   Lecture Form(s)   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
	1	
	1	
	5	
	6	
	1	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

InTroducTion To Global Engineering

CompuTer Programming in Global Engineering

Code   30040   Course Year   1st year   Term   2nd term   Class day & Period   Location   Credits   2

Restriction   Lecture Form(s)   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

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

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

InformaTion Processing Basics

Code   22010   Course Year   1st year   Term   2nd term   Class day & Period   Location   Credits   2

Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Fundamental Mechanics

Code   30100   Course Year   2nd year   Term   1st term   Class day & Period   Location   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

31330

Resources and Energy

Code　31330　　Course Year　2nd year　　Term　1st term　　Class day & Period　　　Location　　　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

Probabilistic and Statistical Analysis and Exercises

Code   30030   Course Year   2nd year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   Lecture Form(s)   Language   Instructor

Course Description   Theory and methodology of probabilistic and statistical analysis is introduced as a basic tool to cope with uncertainty in natural and social systems dealt with in global engineering. The main topics are concept and basic theorems of probability, probability distributions and its use, statistical estimation and testing, and multivariate analysis.

Grading   Grading is done based on the mark on regular examination. Performance in classes and exercises, marks in quiz and mid-term exams are also taken into account. Minimum passing grade is sixty percent.

Course Goals   The goal is to understand fundamental theory of probability and to be capable of using well-known distributions to analysis and design. It is also required that students understand the fundamentals on population and samples, and principle of statistical estimation and testing

Course Topics

Theme	Class number of times	Description
Introduction	1	Role of probabilistic and statistical approach in global engineering and in other engineering fields
Basic theory for probabilistic analysis	4	The concept and basic theory on probability: random variables, probability mass function, probability density function, distribution function, Bayes' theorem, moment generating function, characteristic function, multi-dimensional distribution, transform of random variables
Probability distribution models	4	Probability distributions often used in global engineering are introduced: Bernoulli series and binomial distribution, Poisson series and distribution, normal distribution, return period.
Statistical estimation and testing	3	Basic theory on sampling. Chi-square, t-, and F-distributions. Methods for statistical estimation and testing.
Multivariate analysis	2	Basic methods in multivariate analysis: regression analysis and principal component analysis

Textbook

Textbook(supplemental)

Prerequisite(s)   Prerequisite courses are infinitesimal calculus and linear algebra.

Web Sites

Additional Information

30140

Environmental Health

Code 30140 Course Year 2nd year Term 1st term Class day & Period Location Credits 2

Restriction No Restriction Lecture Form(s) Lecture Language Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
	1	
	5	
	3	
	2	
	3	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Introduction to Civil Engineering

Code　31310　Course Year　2nd year　Term　1st term　Class day & Period　　Location　　Credits　2

Restriction　No Restriction　Lecture Form(s)　Lecture　Language　　Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
Introduction to Civil Engineering	2　3	
Structural Engineering	3	
Hydraulics and Hydrology	3	
Geotechnical Engineering	3	The objective of this course is to introduce the student to the principles that govern the use and application of soil mechanics in Civil Engineering. We will discuss actual field problems and show you how the concepts that are taught in soil mechanics can be applied to understand and solve real engineering problems.
Planning and Mamagement	3	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

30050

Mathematics for Global Engineering

Code   30050   Course Year   2nd year   Term   1st term   Class day & Period   Location   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

Systems Analysis and Exercises for Planning and Management

Code   31340   Course Year 2nd year   Term 2nd term   Class day & Period   Location   Credits 2

Restriction   No Restriction   Lecture Form(s)   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
	6	
	6	
	6	
	6	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Soil Mechanics I and Exercises
I

Code   31620   Course Year   2nd year   Term   2nd term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Language   Instructor

Course Description   The student is expected to learn:the basics of soil formation, classification for engineering purposes, soil compaction, soil water and water flow, consolidation theory, problems on final and time rate of consolidation, the fundamentals of shear strength and deformation behaviour of different soils.

Grading   Grading Policy:Final exam(70%), Midterm exams and assigned homeworks(30%)

Course Goals   After undergoing this course, the student gains adequate knowledge on engineering properties of soil.

Course objective is to provide a fundamental understanding of mechanical behavior of soil materials, including soil classification, compaction, permeability, consolidation, and strength.

Course Topics

Theme	Class number of times	Description
Nature of soil	1	Introductory concepts:Understand the principles of soil behavior and the fundamentals of geothechnical practices in soils.
Geo-disaster with soil	1	Understanding of the geological disasters with soil. Understand geoengineering Ethics
Soil classification and compaction	2.5	Understand the geology of soils, soil classification system, fundamental properties, effective stress, compaction, unsaturated soil and frozen soil
Water flow through soil	3	Understand the permeability and Darcy's law, quick sand condition, seepage snd flow nets.
Midterm exam	0.5	
Consolidation and settlement	3	Understand Terzaghi's one dimensional consolidation theory, the total and effective stress distribution in soil.
Shear Strength of soil	3	Understand shear strength of cohesive and cohesionless soil, Mohr-coulomb failure theory, drained and undrained behavior of clay and sand

Textbook   Text book: Fusao Oka, "Soil Mechanics", Asakura publishing Co., Ltd.

Textbook(supplemental)   Fusao Oka, "Soil Mechanics Exercises", Asakura publishing Co., Ltd.

Prerequisite(s)   The course is designed for students in any major;an earth science background is not required.

Web Sites

Additional Information   Contact Information Associate professor T.Inui
Email:inui@geotech.mbox.media.kyoto-u.ac.jp

Hydraulics and Exercises

Code   30130   Course Year   2nd year   Term   2nd term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
Introduction	1	
Fluid Statics	2	
Elementary Fluid Dynamics	4	
Potential Flows	2	
Viscous Flow and Turbulence	2	
Intermediate Exam.	1	
Dimensional Analysis, Similitude	1	
Viscous Flow in Pipes	5	
Open-Channel Flow	10	
Small Amplitude wave theory	2	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

20510

Engineering Mathematics B1

B1

Code   20510   Course Year 2nd year   Term 2nd term   Class day & Period   Location   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

Code   20510   Course Year 2nd year   Term 2nd term   Class day & Period   Location   Credits 2

Structural Mechanics I and Exercises

I

Code 30080   Course Year 2nd year   Term 2nd term   Class day & Period   Location   Credits 2   Restriction No Restriction

Lecture Form(s)   Language   Instructor

Course Description   The following topics are covered: external forces exerted on structures; properties of forces; sectional forces; stress; strain and displacement/deformation; cross sectional properties; relationship between stress and strain; computation of displacement; buckling of column. Statically determinate structures are to be focused on.

Grading   Grade is given based on the final examination, mid-term examination and reports.

Course Goals   To understand the methods for studying structures at static equilibrium conditions; to understand stress and strain, and the relationship between them; to understand the buckling phenomenon in columns.

Course Topics

Theme	Class number of times	Description
Introduction	1	Structures and elements
		Purpose and application scope of structural mechanics
		Assumptions
		Examples related to engineer's ethics
Properties of forces	1	External forces
		Modeling of external forces
		Force equilibrium conditions
		Static determinate, static indeterminate and unstability
Sectional forces	8	Equilibrium of free body
		Sectional forces
		Sectional forces on differential portion
		Axial force
		Flexural moment and shear force
		Torsion moment
		Influence lines
Stress	2	Stress: force per unit area
		Stresses and coordinate system
Displacement and deformation	4	Displacement
		Deformation
		Strain
		Curvature and torsional ratio
Sectional properties	2	Geometrical moment of area
		Moment of inertia of area
Stress and strain	2	Hooke's Law
		Sectional force and deformation
		Sectional modulus
Calculation of displacement	4	Element in tension/compression
		Deflection of beam
		Deflection of truss
		Statically determinate and indeterminate structures
Buckling of column	2	Buckling phenomenon
		Euler's buckling load
		Eccentrically compressive column

Textbook   To be informed by individual lecturer in his/her first lecture

Textbook(supplemental)   To be announced by individual lecturer in his/her first lecture

Prerequisite(s)   calculus A and B

Web Sites

Additional Information   There are five classes which will be taken in the meantime by corresponding teacher. Office hour (contact information and consultation hours) of the individual lecturer will be given in his/her first lecture.

31320

Fundamental Environmental Engineering I

I

Code   31320   Course Year   2nd year   Term   2nd term   Class day & Period   Location   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

Geophysical Prospecting

Code 31350   Course Year 2nd year   Term 2nd term   Class day & Period   Location   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

Dynamics of Soil and Structures

Code　31110　Course Year　3rd year　Term　1st term　Class day & Period　　Location　　Credits　2

Restriction　No Restriction　Lecture Form(s)　Lecture　Language　　Instructor

Course Description　This course deals with fundamentals and application of vibration theory and elastic wave propagation in civil engineering.

Grading　Based on the performance during the course (including homework) and the results of a final examination.

Course Goals　At the end of this course, students will be required to have a good understanding of:

- Vibration phenomena, response to dynamic loads, fundamental principle of vibration measurement, including manipulation of mathematical manipulation and calculation

- Treatment of vibration problems for multi-degree-of-freedom systems and elastic media

- Fundamental properties of elastic waves that propagate in elastic media and layers

Course Topics

Theme	Class number of times	Description
Vibration of structures and equation of motion	1	Vibration phenomena encountered in civil engineering structures. Impotance and engineering issues of vibration. Derivation of equation of motion.
Free vibration		Definition of the natural period and damping ratio for single degree-of-freedom systems. Derivation of free vibration response.
Force vibration		Resonance curves and phase response curves for forced harmonic vibration. Frequency response characteristics.
Principle of vibration measurement		Background theory of vibration measurement. Accelerometers and seismometers.
Response to arbitrary input	2	Evaluation of dynamic response to arbitrary forcing and earthquake excitation. Response spectra.
Nonlinear vibration		Fundamental properties of nonlinear dynamic response of structures associated with elasto-plastic behavior.
Vibration of 2-DOF systems	1	Solution of equations of motions for 2-degree-of-freedom systems representing free vibration. Concept of normal vibration modes.
Natural frequencies and natural modes of vibration	1	Relationship between the natural frequencies, normal vibration modes of multi-degree-of-freedom systems and eigenvalue analysis.
Damped free vibration of MDOF systems	1	Vibration of multi-degree-of-freedom systems with damping. Analysis of MDOF systems using damping using normal vibration modes.
Forced vibration and response to arbitrary input for MDOF systems	1	Modal analysis to evaluate the dyanmic response of multi-degree-of-freedom systems for harmonic and arbitrary excitation.
Vibration of continuum	1	Vibration of shear beams. Flexural vibration. Wave equation. Solution of shear vibration problem.
Elastic wave	1	Properties of elastic waves travelling in elastic media and elastic layers. Fundamental concept in deriving solutions of elastic wave propagation problems.

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

Textbook(supplemental)

Prerequisite(s)　Calculus, linear algebra, Structural Mechanics I and Exercises (30080), Structural Mechanics II and Exercises (30110)

Web Sites　https://www.t.kyoto-u.ac.jp/lecturenotes/fe/a/31110/

Additional Information　Office hours are not specified; Questions to instructors are accepted by appointment

Atmospheric and Global Environmental Engineering

Code 31400   Course Year 3rd year   Term 1st term   Class day & Period   Location   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

Fundamental Theory of Elasticity and Stress Analysis

Code   32000   Course Year   3rd year   Term   1st term   Class day & Period   Location   Credits   4

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
	2	
	2	
	5	
	3	
	3	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Construction Materials

Code   30240   Course Year   3rd year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description   Knowledge and techniques to use construction structural materials from micro-structures to macro-structures are introduced.

Grading   Evaluate considering the scores of final examination and the submitted reports.

Course Goals   The student will understand the properties, production and testing methods of concrete, steel, composite materials etc. In addition, the student will understand the way of thinking for construction materials.

Course Topics

Theme	Class number of times	Description
Introduction	1	Classification of materials, history of construction materials, ethics for civil engineers and current topics are introduced
Crystal structure	1	Bond between atoms, ideal strength, dislocation, yield, and mechanical properties are introduced.
Metallic material	1	Iron, blast furnace, refine, steel, transformation, heat treatment and metallic new materials are introduced.
Corrosion & protection	1	durability, corrosion, deterioration mechanism, carbonation, chloride induced corrosion and corrosion protection are explained.
Cement	1	Types of cements, chemical composition, chemical compound, hydration, hydration heat and blended cement are introduced.
Admixture	1	Chemical admixture, water-reducing admixture, air-entraining admixture, mineral admixture, pozzolanic reaction, latent hydraulic property and high-range admixture are introduced.
Aggregate	1	Moisture condition, Chloride ion, Total chloride ion content, alkali-silica reaction and total alkali content are explained.
Fresh concrete	1	Workability, rheology, consistency, segregation and mix design are introduced.
Hardened concrete	2	water cement ratio, compressive strength, flexural strength, tensile strength, durability and testing methods are introduced.
Non-destructive testing method	1	Surface hardness, ultrasonic pulse, thermography, half cell potential and polarization resistance are explained.
Special concrete	1	Fiber reinforced concrete, flowing concrete, MDF cement and mineral new materials are explained.
Polymer material	1	Resin, rubber, fiber, polymer concrete and organic new materials are explained.
Asphalt & topics	1	Asphalt, straight asphalt, blown asphalt, asphalt emulsion and current topics are explained.
Final examination	1	The final examination is to be given during the final exam period.

Textbook

Textbook(supplemental)   Kiyoshi Okada et al: Construction materials, Ohm ltd (in Japanese)

Tadashi Fujiwara et al: Story of concrete, Gihodo Shuppan (in Japanese)

Prerequisite(s)

Web Sites

Additional Information

Water Quality

Code   30530   Course Year   3rd year   Term   1st term   Class day & Period   Location   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

Fluid Mechanics

Code   31650   Course Year   3rd year   Term   1st term   Class day & Period   Location   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

Environmental Engineering, Laboratory I

1

Code   31410   Course Year 3rd year   Term   1st term   Class day & Period   Location   Credits   3

Restriction   No Restriction   Lecture Form(s)   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Structural Mechanics II and Exercises

II

Code 31640 Course Year 3rd year Term 1st term Class day & Period Location Credits 3

Restriction No Restriction Lecture Form(s) Language Instructor

Course Description Fundamentals of structural analysis based on energy principle

Principle of virtual work and some energy principles for structural analysis

Approaches for study of statically indeterminate structures

Fundamentals of elastic stability

Fundamentals of structural analysis by matrix methods

Grading Grade is given based on the final examination, mid-term examination and reports.

Course Goals To solve structures such as truss and beam by the principle of virtual work/energy principles

To solve statically indeterminate structures by force method and displacement method

To understand the stability of equilibrium

to get the stiffness matrix of simple trusses

Course Topics

Theme	Class number of times	Description
Work, energy and virtual work	13	Introduction
		Work, virtual work and energy
		Castigliano's theorems and principle of minimum potential energy
		Virtual work and complementary virtual work
		Principle of virtual work (virtual displacement)
		Principle of complementary virtual work(virtual force)
		Reciprocal theorems
Static determinate and indeterminate	1	Degree of freedom and degree of indeterminacy
Solutions to statically indeterminate structures	6	Introduction of force method and displacement method
		By equations of elasticity
		By displacement method
Structural stability	3	Stability criteria
		Deformation of rigid body-elastic spring system
		Deformation of elastic beam- column system
Basis of matrix method of structural analysis	4	Matrix adapted to equilibrium equations/displacement conditions
		Analysis of plane truss
Structral analysis engineer's ethics	1	Examples on structral analysis engineer's ethics related to safety of structure analyses such as application scope, precision of analysis and reliability of structural analysis

Textbook To be informed by individual lecturer in charge in his/her first lecture

Textbook(supplemental) M. Matsumoto, E. Watanabe, H. Shirato, K. Sugiura, A. Igarashi, T. Utsunomiya, Y. Takahashi: Structure mechanics , Maruzen Ltd.

Prerequisite(s) calculus A and B, Linear Algebra A and B, Structure mechanics and Exercises

Web Sites

Additional Information There are four classes which will be taken in the meantime by corresponding teacher. Office hour (contact information and consultation hours) of the individual lecturer will be given in his/her first lecture.

31390

Fundamental Environmental Engineering II

II

Code   31390   Course Year   3rd year   Term   1st term   Class day & Period   Location   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

Hydraulics and Hydrodynamics

Code   31360   Course Year   3rd year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description   Lecture of fundamental theories of fluid dynamics and applications to hydraulic engineerging

Basic equations, potential flow theory, boundary layer theory and turbulent flow Introduction of basic modelings about fluid motion and heat transfer in atmosphere related to hydrology and meteorology

Grading   Attendance, reports and final examination

Course Goals   Learning elementary knowledge of hydraulics and important topics of hydrodynamics science

Course Topics

Theme	Class number of times	Description
Introduction	1	Academic history of hydraulics and fluid dynamics
Momentum equation and potential flow theory	2	Theories of perfect fluid and potential flow
Basic study of boundary layer theory		Appearance of boudary layer theory
Application of boundary layer theory	1	Application of boundary layer theory to hydraulic engineering
Fluid force	1	Lift force, drag force and shear stress
Introduction of turbulent flow	1	Introduction of turbulent flow
Hydrology and Meteorology	2	Vertical stability of atmosphere Generation process of rain fall Fundamental knowledge of atmospheric physics
Atmospheric boundary layer		Atmospheric boundary layer related to global warming problems Heat and momentum exchanges
Dynamics of rotational fluid		Generation theory of low pressure system
Unsteady pipe flow		Fundamental study of unsteady pipe flow
Unsteady open-channel flow		Fundamental study of unsteady open-channel flow Theory of Kleiz Seddon

Textbook

Textbook(supplemental)

Prerequisite(s)   Hydraulics and Exercises

Web Sites

Additional Information

30570

Radiological Health Engineering

Code 30570   Course Year 3rd year   Term 1st term   Class day & Period   Location   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

Continuum Mechanics

Code   31170   Course Year   3rd year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description   Continuum Mechanics is a branch of the physical sciences concerned with the deformations and motions of continuous media under the influence of external effects.

The following basic items are explained with exercises: Fundamentals of tensor analysis, Mathematical formulation of srain, motion and stress, Conservation laws of continuous media (mass, momentum, angular momentum, energy), Constitutive laws of elastic body and Newton fluids, Principle of vurtual work and minimum potential energy based on the calculus of variations, Finite Element Method, Applications in Elasticity and Fluid Dynamics.

Grading   Regular examination (90 p.c.) and Midterm examination(10 p.c.)

Course Goals   Based on the clear understanding of the mathematical formulation on deformation, stress and constitutive laws, students are requested to understand the derivation of the Equation of motion, Conservation laws of angular momentum and energy, certainly. Principle of vurtual work and minimum potential energy are attached inportance as the basis of Finit Element Method.

Course Topics

Theme	Class number of times	Description
Elementary knowledge on tensor analysis	2	Definition of tensors, Integral theorem, Material derivative over a material volume, Transformation of components of tensors, etc.
Stress, strain and strain rate tensors	2	Definition of stress, strain and strain rate tensors, Transformation of components of these tensor variables, Invariants under coordinates transformation, Compatibility condition of strain, etc.
Mathematical formulation of conservation laws	2.5	Mathematical expression of conservation laws of continuous media (mass, momentum, angular momentum, energy)
Constitutive law of solids and fluids	2.5	Constitutive laws of elastic & visco elastic body and Newton fluids
Principles based on the calculus of variations and FEM	2	Principle of vurtual work and minimum potential energy based on the calculus of variations, Finite Element Method, etc.
Applications in elasticity and fluid dynamics	3	Applications in Elasticity and Fluid Dynamics

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

Textbook(supplemental)

Prerequisite(s)   Elementary knowledge on differential and integral calculus and linear algebra

Web Sites

Additional Information   Students can contact with Instractors by sending e-mail to hosoda@mbox.kudpc.kyoto-u.ac.jp

31080

Engineering Geology and Exercises

Code 31080 Course Year 3rd year Term 1st term Class day & Period Location Credits 3

Restriction No Restriction Lecture Form(s) Language Instructor

Course Description

Grading

Course Goals

Course Topics

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

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Coastal Environmental Engineering

Code 31370 Course Year 3rd year Term 1st term Class day & Period Location Credits 2

Restriction No Restriction Lecture Form(s) Lecture Language Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
Coastal Sediment Transport	1	
Coastal Sediment Transport	6	
Nearshore Current	1	
Wave Transformation	2	
Wave Statistics and Wave Forecasting	1	
Tsunami and Storm Surge: Coastal Disaster Prevention	2	
Wave Force on Coastal Structures	1	
Evacuation Planning under Coastal Disasters	1	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

30300

Fundamentals of Hydrology

Code   30300   Course Year   3rd year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
The Hydrologic Cycle	1	
Solar Radiation and Energy Balance of the Earth	1 2	
Precipitation	1	
Evaporaion and Transpiration	2.5	
Interception and Infiltration	1.5	
Slope Runoff	2	
Flood routing	1.5	
Runoff Model	1.5	
Frequency Analysis in Hydrology	2	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Soil Mechanics II and Exercises

II

Code   31070   Course Year   3rd year   Term   1st term   Class day & Period   Location   Credits   3

Restriction   No Restriction   Lecture Form(s)   Language   Instructor

Course Description   The student is expected to learn:soil consolidation and stress distribution in soil media, shear strength of soil, lateral earth pressure-active and passive conditions, bearing capacity of shallow and deep foundations, stability of slope and soil dynamics.

Grading   Grading Policy:Final exam(70％), Midterm exam and assigned homeworks(30％)

Course Goals   The course objective is to provide an understanding of key engineering properties and mechanical behavior of soil materials including consolidation, shear deformation and strength properties, bearing capacity of foundations, stability of slopes and excavations, and dynamic properties of soil.

At the end of the course, students will be able to:

1.Understand the principles of strength and deformation behavior of different soils.

12.Understand and apply the fundamentals of soil mechanics and geotechnical compitation methods.

3.Understand the soil-structutes interaction.

Course Topics

Theme	Class number of times	Description
Consolidaton	2	Understand Terzaghi's theory of consolidation, laboratory consolidation test, field consolidation curve, normally consolidated condition and over consolidated condition, and problems on final and time rate of consolidation.
Stresses in ground	1	Understand stresses in the ground due to loading, soil strength and pressure distribution below foundation.
Shear derormation and shear strentgh	2	Understand measurement of shear strength and triaxial compression tests, strength parameters, drained and undrained behavior of clay and sand, and stress path for conventional triaxial test.
Theories of earth pressure	2	Understand the lateral earth pressure in active and passive states, Rankine's theory in cohesive and cohesionless soil, Coloumb's wedge theory with condition for critical failure plane, earth pressure on retaining walls of simple configurations.
Midterm exam	0.5	
Bearing capasity of foundation	1.5	Understand the definition of bearing capacity, ultimate bearing capacity, net ultimate bearing capacity, net safe bearing capacity and allowable bearing pressure, and derivation of Terzaghi's general bearing capacity equation for continuous footing and basic numerical problems associated with it.
Slope stability	2	Understand the failure mechanisms of both infinite and finite slopes and methods of slope stability analysis.
Soil dynamics	2	Understand the nature of dynamic loads, mchanism of liquefaction and liquefaction parameters, and stress conditions on soil element under earthquake loading.
Infrastructure and ground	1	Understand the recent geoengineering projects and ethical responsibility for geoengineers.

Textbook   Text book:Fusao Oka,"Soil Mechanics",Asakura publishing Co., Ltd.

Textbook(supplemental)   Fusao Oka,"Soil Mechanics Exercises",Asakura publishing Co., Ltd.

Prerequisite(s)   A required prerequisite is knowledge of soil mechanics. Soil mechanics I and Exercises(31620) would be helpful as a prerequisite.

Web Sites

Additional Information   Contact Information Associate professor S.Nishiyama

Email:nisiyama@geotech.kuciv.kyoto-u.ac.jp

30590

Environmental Plant Engineering

Code   30590   Course Year 3rd year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Experiments on Soil Mechanics and Exercises

Code 31380 Course Year 3rd year Term 1st term Class day & Period Location Credits 2
Restriction No Restriction Lecture Form(s) Seminar and Exercise Language Instructor

Course Description The first aim of this course is to illustrate some of the principles taught during the soil mechanics course. This course allows the students to become familiar with fundamental tests used in practice to classify soils and quantify their engineering properties.

Grading Laboratory: Each student is expected to conduct the experiments to gain hands on experience.

Attendance: Full attendance to lecture and laboratories is compulsory.

Grading policy:Laboratory Report, 100% of the course grade.

Course Goals To help students in understanding the soil mechanics concepts given in the Soil Mechanics course with hands on experience.

To be able to carry out all soil mechanics fundamental experiments.

To collect, analyze and interpret experimental data.

To have a feeling of engineering properties of geomaterials.

Course Topics

Theme	Class number of times	Description
Introduction and Orientation	1	
Physical properties of soils	1	Structure of soil, engineering classification of soils, Consistency Limits, grain size distribution
Compaction Test	1	Laboratory compaction tests, factors affecting compaction
Hydraulic Conductivity Test	2	permeability and seepage, darcy's law, hydraulic gradient, determination of coefficient of permeability,construction of flow nets
Consolidation Test	1	Fundamentals of consolidation, laboratory tests, settlement-time relationship
Uniaxial compression test	1	Stress-strain and strength behavior of clays
Direct Shear Test	1	Mohr-Coulomb failure criterion, laboratory tests for shear strength determination
sounding methods	0.5	N-values of standard penetration test and elastic wave exploration
Centrifuge model test	0.5	Experiments using the similarity law of centrifuge test
Computer Exercise and numerical analysis	2	Fundamentals of math and physics for geotechnical engineering
Special Lecture	1	Special lecture on soil mechanics
Closer and review	2	

Textbook To be announced in the class.

Textbook(supplemental)

Prerequisite(s) Soil mechanics I and exercises(31620)

It is recommended to take soil mechanics II and exercises in parallel.

Web Sites

Additional Information Contact information

Associate professor:T.Inui

Email:inui@geotech.mbox.media.kyoto-u.ac.jp

31660

Physical Chemistry

Code   31660   Course Year   3rd year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
	2	
	4	
	4	
	2	
	2	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Planning and Management of Social Systems

Code   30440   Course Year   3rd year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description   The aim of "Planning and Management of Social Systems" is to provide the basic knowledge of infrastructure planning and management, and show the basic concepts and frameworks of typical models that are indispensable for systems analyses. Moreover the lecture introduces theories in social psychology and ethnography. It further covers the methods of social survey and problem structuring where group works with presentation are scheduled.

Grading   On the presumption of sufficient attendance, 30% of score is valuated on reports and 70% on examination.

Course Goals   It is targeted to understand roles of infrastructure planning and management, typical models for systems analysis, methods of social survey and problem structuring. It is further expected to enhance the ability of discussion for reaching solutions.

Course Topics

Theme	Class number of times	Description
Guidance	1	Problems of infrastructure planning and management, and its methodology. Abstract of systems analysis.
Queuing theory	1	Fundamental structure of queuing system. Formulation and solution of M/M/S system.
Marcov model	2	Marcov process. Transition probability matrix. Steady state.
Time-series predicting model	2	Serial correlation. Auto-Regressive model. AutoRegressive-Moving Average model.
Multivariate analysis	1	Principal component analysis. Quantification theory
Game theory	2	Strategic interdependency. Nash equilibrium. Typical models.
Social survey	1	Objective and methods of social survey. Case examples.
Ethnography and content analysis	2	A case study: Historical change of public image of civil engineering.
Structuring problems	1	KJ method. Interpretive Structural Modeling.
Comprehensive exercise	1	Group work with application of KJ method. Presentation.

Textbook   Systems analysis for Infrastructure planning: phenomenal analysis, Morikita pub. (in Japanese)

Textbook(supplemental)   None

Prerequisite(s)   Fundamental understanding of probability

Web Sites   None

Additional Information   Office-hours are not specified whereas the ways to make contact with teachers are informed in classes.

31730

Engineering Mathematics B2

B2(   )

Code   31730   Course Year   3rd year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Engineering Mathematics B2

B2(   )

Code   31730   Course Year   3rd year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   Lecture Form(s)   Lecture   Language   Instructor

Engineering Mathematics B2

B2(   )

Code   31740   Course Year   3rd year   Term   1st term   Class day & Period   Location   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

Experiments on Hydraulics

Code   30870   Course Year   3rd year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Exercise   Language   Instructor

Course Description   Guidance of laboratory experiments in hydraulics and measurement instruments.

Eight experiments are conducted about pipe flow, open-channel flow, waves, flow in porous media, density flow, hydrodynamic force, sediment transport

Grading   Attendance : 40 points

Reports and homework : 60 points

total : 100 points

Course Goals   Understanding hydraylic phenomena through various flows observed in the hydraulic laboratory

Course Topics

Theme	Class number of times	Description
Guidance	1	Guidance of hydraulics laboratory and course goals
Instruments in hydraulics laboratory	1	Introduction of measurement instruments Methods and principles of hydraulic experiments
Experiments 1 - 4	4	Rotation for eight experiments A to H as mentioned below
Guide for writing reports	1	Guide for writing reports
Visit hydraulic structures in real rives and lakes	1	Visit hydraulic structures such dam and banks in real rives and lakes
Experiments 5 - 8	4	Rotation for eight experiments A to H as mentioned below
Guide for writing reports	1	Guide for writing reports
A)Transition from lamiar to turbulent flows, friction law in pipe flows	(1)	Observation of dye patterns in lamiar and turbulent flows in pipes Understanding Hagen-Poiseuille flow and Prandtl-Karman flow
B)Velocity and free-surface profiles in open-channel flows	(1)	Measurements of free-surface and velocity profiles Comparison measured results with theories
C)Hydraulic jump in horizontal bed	(1)	Understanding hydraulic jump Comparison measured free-surface variations with theories
D)Transmission and deformation behaviors of waves	(1)	Measurements of wave deformations, wave height and orbits of water particles Comparison measured data with small amplitude wave theory and breaking-wave formula
E)Flow in porous media and underground water	(1)	Measurments steady flows in porous media by using pipenet model and Hele-Shaw model
F)Density flow	(1)	Measurement and understanding transport mechanisms in density flows Evaluations of front speed and related friction laws
G)Hydraulic force on cylinder	(1)	Measurements of pressure distributions on cylinder surface in open-channel flows Observation of Karman vortex behind cylinder
H)Sediment transport	(1)	Measurements and observations of bed load in open-channel flows. Comparison with theories and formulae

Textbook

Textbook(supplemental)

Prerequisite(s)   Hydraulics and Exercises

Web Sites

Additional Information

Experimental Basics in Earth Resources and Energy Science, Laboratory.

Code 32200 Course Year 3rd year Term 1st term Class day & Period Location Credits 2

Restriction Lecture Form(s) Language Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Public Economics

Code 30850   Course Year 3rd year   Term 1st term   Class day & Period   Location   Credits 2

Restriction No Restriction   Lecture Form(s) Lecture   Language   Instructor

Course Description

Grading   Final Exam:70-80%, Reports during classes: 20-30%

Course Goals   To understand basic concept of micro economics for project evaluation about infrastructure

Course Topics

Theme	Class number of times	Description
Introduction	1	
Consumers' behavior	3	
Exercise (1)	1	
Firms' behavior	3	
Exercise (2)	1	
Perfect Comititive Market	1	
Externality	1	
Public Goods	1	
Exercise (3)	1	
Cost benefit analysis	2	

Textbook   Hal R. Varian: Intermediate Microeconomics: A Modern Approach, Seventh Edition, W. W. Norton & Company, 2005

Textbook(supplemental)

Prerequisite(s)   Students are supposed to have earned a credit for "Systems Analysis and Exercises for Planning and Management".

Web Sites

Additional Information   Contact email: pub@psa2.kuciv.kyoto-u.ac.jp

Surveying and Field Practice

Code   30400   Course Year   3rd year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Language   Instructor

Course Description   Lectures and field practice of the surveying are conducted. In the lectures, survey techniques, details on the instruments, adjustment of the errors contaminated in the measured data are introduced. In the field practice, the student will understand the survey procedure using the instruments.

Grading   Evaluate considering the scores of the intermediate and final examinations, and the reports and attendance of the field exercise.

Course Goals   The student will understand the background and theory to reduce the errors contaminated in the measured data and to estimate the reliable parameters.

The student will be able to derive the most probable value and standard error using the least square method and the law of error propagation.

The student will understand the purpose of the various kinds of survey.

In the field exercise, the student will acquire the preparedness to plan the survey and the attitude to cooperate with other students for the accomplishment of the survey.

Course Topics

Theme	Class number of times	Description
Introduction of survey	1	The purpose, history and content of the surveys are introduce. In addition, the survey applications and the advanced technology of the surveys are also introduced.
Distance and angular measurement	3	Distance and angular measurement, simple and fundamental surveys, are introduced. The student will learn how to set the instrument properly, and the technique to measure the angles using theodolite.
Control survey	6	The survey plan for the control survey is introduced, and the practice of the traverse survey, one of the most traditional control surveys, is conducted.
Leveling	3	The methodology of leveling and the adjustment of the errors are introduced, and the practice is conducted.
Plane survey and topographic survey	4	The methodology of the plane survey and topographic survey is introduced. The features of the topographic map produced through the survey are explained.
Theory of errors	4	The concept of the errors and the law of the error propagation are introduced.
Least square method	6	The concept of the least square method (LSM), popular approach to the processing of the survey data, is introduced. The student will learn how to apply the LSM for the practical application through the exercise.
Error adjustment	4	The methodology to adjust the errors in the traverse survey is introduced, and the student will learn how to obtain the most probable parameters through the exercise.
Photogrammetry	4	The overview of photogrammetry is introduced, and the practice using the instrument is conducted.
GPS survey	4	The theory of GPS and GPS survey are introduced, and the practice of GPS survey is conducted.

Textbook   Chuji Mori, "Surveying 1: basic" (in Japanese)

Textbook(supplemental)

Prerequisite(s)   Linear Algebras, Mathematical Statistics

Web Sites

Additional Information

SeWerage System Engineering

Code 30550   Course Year 3rd year   Term 2nd term   Class day & Period   Location   Credits 2

Restriction No Restriction   Lecture Form(s) Lecture   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
	3	
	3	
	5	
	3	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Numerical Methods for Engineering and Exercises

Code   32100   Course Year   3rd year   Term   2nd term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Urban and Landscape Design

Code　31630　Course Year　3rd year　Term　2nd term　Class day & Period　　Location　　Credits　2

Restriction　No Restriction　Lecture Form(s)　　Language　　Instructor

Course Description　To design the urban facilities, open spaces, landscapes of streets and district, is to create the place for the people and their activities. It enabls to make places in harmony with the environment by making connections of each space of the city, region, and nature. The class aims to consider the vision of cityscape and learn the practical design skills and representation.

Grading　Total points will be scored in design practice and reports.

Course Goals　To understand the ways of design of the urban facilities, open spaces, landscape of streets and district. To acquire basic skills of landscape design.

Course Topics

Theme	Class number of times	Description
Guidance, Basic ideas of landcape design	1	Significance and scope of urban and landscape design. Fundamentals of visual perception.
Theory of urban and landscape design	7	Lectures on the theories and case study of the design of cityscapes, streetscapes, waterfronts, bridges. Practice of perspective Drawings.
Design practice	5	Design study for the renovation planning of the university campus. Analyzing the present situation of the public space and the landscape; planning and making a design concept; and concrete images. The training of design representation.

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information　Office hours are not especially set. Ask any questions by mailing or visiting professors (Kawasaki, rm.202; Kubota, rm.201; Yamaguchi, rm.203 at C1-1, Katsura Campus). The theme of design practice could be changed partially.

Water Supply Engineering

Code 30540   Course Year 3rd year   Term 2nd term   Class day & Period   Location   Credits 2

Restriction   No Restriction   Lecture Form(s) Lecture   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

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

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

31530

Transport Policy

Code 31530   Course Year 3rd year   Term 2nd term   Class day & Period   Location   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

Advanced Resources and Energy Engineering

Code   31440   Course Year   3rd year   Term   2nd term   Class day & Period   Location   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

Solid Waste Management

Code 30580 Course Year 3rd year Term 2nd term Class day & Period Location Credits 2

Restriction No Restriction Lecture Form(s) Lecture Language Instructor

Course Description

Grading

Course Goals

Course Topics

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

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Urban and Regional Planning

Code 30450 Course Year 3rd year Term 2nd term Class day & Period Location Credits 2

Restriction No Restriction Lecture Form(s) Lecture Language Instructor

Course Description This lecture aims to learn the process of urban planning and basic measures in urban facility planning, land use planning and transportation planning and to understand the basic theory and models for urban planning.

Grading Grades will be based on the results of the final examinations, report and class participation.

Course Goals To learn fundamental knowledge on urban planning and to understand the structure of urban problems.

Course Topics

Theme	Class number of times	Description
Introduction	1	
Basic measures in urban planning	2	
Land use plan and district plan	2	
Urban models	2	
Urban environmental problems	3	
Funding systems for urban planning	2	
Urban transport policy	2	

Textbook No textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

31520

Transportation Management Engineering

Code 31520 Course Year 3rd year Term 2nd term Class day & Period Location Credits 2

Restriction No Restriction Lecture Form(s) Lecture Language Instructor

Course Description This lecture is aimed at explaining methodologies of survey, design and operation for urban traffic and transportation system, which may contribute to enhancement in safety and efficiency of travel.

Grading Students will be graded considering both assingnments and term paper.

Course Goals The students who complete this course are expecting to explain well the significance in the methodologies used for survey, desgin and operation of transportation planning and traffic engineering. In addition, these students are expecting to apply the methodolgies for the actual case.

Course Topics

Theme	Class number of times	Description
Outlines of Traffic and Transportation Engineering	1	
Road Transportation Planning	2	
Survey and Analysis of Travel Behavior	2	
Survey and Analysis of Road Network	2	
Traffic Flow Theory	2	
Plannig and Design of Road	1	
Traffic Operation	2	
Approaches for Travel Management	2	

Textbook Y. Iida and R. Kitamura: Traffic Engineering (written in Japanese), Ohmsha, 2008.

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information The way to contact with the professors for Q & A is provided at the first class of this course.

Rock Engineering

(   )

Code   31750   Course Year   3rd year   Term   2nd term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description   Design and construction technology of rock structure (Underground cavern, tunnel, rock slope, etc.), geology, mechanical properties of rock and rock fracture, laboratory tests and field measurements of rock and rock mass are introduced and lectured. Design exercise of rock structure is also introduced.

Grading   Evaluation is decided overall as 35% first examination, 45% final examination and 20% of reports and subjects.

Course Goals

Course Topics

Theme	Class number of times	Description
Introduction	1	
Geology	1	
Rock strength and failure	2	
Classification and index propeties of rock fracture	2	
Groundwater	1	
Field measurements of rock mass	3	
Application of rock engineering	3	

Textbook

Textbook(supplemental)   Society of Material Science, Japan: Rock Mechanics

Prerequisite(s)

Web Sites

Additional Information

31760

Rock Engineering

(   )

Code   31760   Course Year   3rd year   Term   2nd term   Class day & Period   Location   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

Geoenvironmental Engineering

Code   31510   Course Year   3rd year   Term   2nd term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description   This course provides the knowledge on geotechnical engineering related to soft ground improvement, natural disaster mitigation, and geo-environmental issues.

Grading   Grading will be made based on the final exam and attendances.

Course Goals   The goal of this course is to understand the geotechnical engineering contributing to disaster prevention and environmental issues.

Course Topics

Theme	Class number of times	Description
Soft ground improvement	3	(1) Principle of ground improvement, (2) innovative materials including geosynthetics, and (3) road and pavement engineering.
Environmental Geotechnics	5	(1) Remediation of contaminated soils and groundwaters, (2) waste containment, and (3) reuse of waste materials in geotechnical applications.
Geo-disaster (1)	3	(1) Types of natural disasters, geo-disasters, hazard map, mechanism of liquefaction, (2) landslides, (3) damages to river embankment
Geo-disaster (2)	3	(1) Performance-based design for geo-disaster, (2) measures against liquefaction, (3) environmental vibrations and measures.
Exam	1	

Textbook   Handouts will be provided.

Textbook(supplemental)

Prerequisite(s)   "Soil mechanics I and Exercises (31620)" would be helpful as a prerequisite.

Web Sites

Additional Information   Contact Information: Professor T. Katsumi at tkatsumi$_{am}$box.kudpc.kyoto-u.ac.jp.

31800

Materials and Plasticity

Code   31800   Course Year   3rd year   Term   2nd term   Class day & Period   Location   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

32300

Geological and Geophysical Survey,Field Excursion

Code   32300   Course Year   3rd year   Term   2nd term   Class day & Period   Location   Credits   1

Restriction   No Restriction   Lecture Form(s)   Seminar and Exercise   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
	2	
	6	
	1	
	2.5	
	2.5	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

31540

Environmental Engineering , LaboratoryII

2

| Code | 31540 | Course Year | 3rd year | Term | 2nd term | Class day & Period | | Location | | Credits | 2 |

Restriction   Lecture Form(s)   Exercise   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

River Engineering

Code 30460   Course Year 3rd year   Term 2nd term   Class day & Period   Location   Credits 2   Restriction No Restriction

Lecture Form(s) Lecture   Language   Instructor

Course Description   It is important to consider about rivers on earth comprehensibly in view of the various aspects based on natural science and engineering. The fundamental knowledge to consider rivers and make the plan 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 defense, environmental improvement planning, sediment transport system), river structures.

Grading   regular examination, quiz in class, attendance and reprts

Course Goals   to learn the elementary knowledge and grounding to consider rivers from the various points of view such as natural science, engineering & technology and social science.

Course Topics

Theme	Class number of times	Description
Various viewpoints on rivers and river basins	1	Various viewpoints on rivers and river basins, Various rivers on the earth, Formation processes of river basins, long term environmental changes of rivers and its main factors
Precipitation, water cycle and run-off phenomena	1	Elementary knowledge of Meteorology, Statistical Hydrology and Run-off Analysis
River flow and river channel processes(1)	1	Flood flow simulation, Sediment transport in alluvial stream
River flow and river channel processes(2)	1	River morphology(segments, river meandering, sand waves), Numerical analysis of river channel processes, Sediment run-off in mountaneous areas
Application of numerical hydraulics to environmental issues	1	Prediction on vertical distributions of water qualities in a lake, Depletion of DO near the bottom of the Northern Part of Lake Biwa due to Global Warming, etc.
Structure and functions of river and lake eco-system(1)	1	Hierarchical structures and classes of ecological system in rivers, Relation between unit river morphology and habitat structure, Classification of microhabitats and its origin, Longitudinal and reach scale distributions of biological communities and
Structure and functions of river and lake eco-system(2)	1	Function of ecological system in rivers, Sutable conditions of habitats for biological communities, Mass transfer mechanism in rivers, Nutrient spiraling, Impact assesment of river environments and Physical Habitat Simulation Model
Structure and functions of river and lake eco-system(3)	1	Function of ecological system in lakes, Classification of natural lakes and ponds by thermal stratification and thermal convection, Relation between type of lakes and biota (fauna and flora), Characteristics of ecological system in man-made reservoirs
Integrated river basin planning(1)	1	River law, Fundamental river management plan, River improvement plan, Procedures of flood defense planning
Integrated river basin planning(2)	1	Flood invasion analysis and Hazard Map, Ecessive flood and comprehensive flood disaster prevention measures, River structures(groines and levees)
Integrated river basin planning(3)	1	Evaluation of people's consciousness for river improvement works by means of CVM and Conjoint Analysis in view of flood protection, water utilization and environmental conservation
Integrated river basin planning(4)	1	River environmental improvement plan, Normal discharge, River restoration projects, etc.
Integrated river basin planning(5)	1	Classification of river structures and its functions, Impact assesments of the construction of dam reservoirs and estuary barrages, etc.
Integrated river basin planning(6)	1	Comprehensive management of sediment outflow and sediment budgets in river basins, etc.

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

Textbook(supplemental)

Prerequisite(s)   Elementary knowledge of Hydraulics, Hydrology and Ecology

Web Sites

Additional Information   Students can contact with instructors by sending e-mail to hosoda@mbox.kudpc.kyoto-u.ac.jp .

30760

Measurement Systems

Code 30760 Course Year 3rd year Term 2nd term Class day & Period Location 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

Water Resources Engineering

Code 30320 Course Year 3rd year Term 2nd term Class day & Period Location Credits 2

Restriction Lecture Form(s) Lecture Language Instructor

Course Description Methodology for water resources development, management and conservation is introduced from the engineering viewpoint. Main topics are distribution of water resource on the earth, grasp and prediction of water demand, planning and design of water resources systems, estimation and prediction of river flow, policy and water rights, and operation of reservoirs.

Grading Grading is done based on the mark on regular examination. Minimum passing grade is sixty percent.

Course Goals The goal is to understand the basic theory and methodology for water demand prediction, water resources systems design, river flow estimation, water resources policy and reservoir operation.

Course Topics

Theme	Class number of times	Description
Introduction	1	Purpose and target of water resources engineering
distribution of water resources	1	spatial and temporal distribution of water resources
Water resources systems planning	2	water demand prediction, development and alloocation of water resources
Integrated river basin management	2	way of integrated management, multi-criteria and simulation for basin management, culture related to water resources
Estimation of river flow	2	general methods for river flow estimation, uncertainties in river flow estimation
Water rights	2	water rights and river flow, legal and institutional aspect of water rights, policy for water resources
Operation of water resources systems	3	planning and management, off-line and real time operation, optimization of reservoir control
Global warming and droughts management	1	characteristics of droughts, impact of climate change

Textbook

Textbook(supplemental)

Prerequisite(s) It is desirable that students have already learned fundamental hydrology and systems analysis for planning and management.

Web Sites

Additional Information

Mechanical Properties of Solids and Fracture Mechanics

Code   31900   Course Year   3rd year   Term   2nd term   Class day & Period   Location   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

Materials testing for mineral science and technology

Code   31570   Course Year   3rd year   Term   2nd term   Class day & Period   Location   Credits   1

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

30770

Separation Technology

Code 30770   Course Year 3rd year   Term 2nd term   Class day & Period   Location   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

Geoinformatics

Code   31480   Course Year   3rd year   Term   2nd term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description   Techniques to collect, manage and analyze the spatial data and information related to the terrain and environment are introduced. Especially, Geographic Information System (GIS), satellite remote sensing and digital photogrammetry are focused on.

Grading   Evaluate considering the scores of intermediate examination (remote sensing and photogrammetry) and final examination (GIS), and the submitted reports.

Course Goals   The student will understand the techniques to obtain the spatial data, e.g. remote sensing and photogrammetry, and the system to effectively show and analyze such data, e.g. GIS. In addition, the student will understand the relationship between the techuniques and the system.

Course Topics

Theme	Class number of times	Description
Introduction	1	The purpose and role of geoinformatics, and the techniques related to geoinformatics are introduced.
Image processing	2	The student will understand (1) image format, (2) spatial filtering, (3) feature extraction, and (4) geometric transformation.
Digital photogrammetry	2	The student will understand (1) interior orientation, (2) exterior orientation, (3) colinearity condition, and (4) coplanarity condition, and (5) epipolar line.
Remote sensing	2	The student will understand (1) visible and reflective infrared remote sensing, (2) thermal remote sensing, (3) microwave remote sensing, and (4) LiDAR (Light Detection and Ranging).
	6	

Textbook   Handout will be provided if necessary.

Textbook(supplemental)   Japan Association on Remote Sensing, "Remote Sensing Note", Kohei Cho, "Spatial Data Analysis using GIS"

Prerequisite(s)   It is expected that the student has completed the courses,
(1) Statistics (first semester in the second year), and
(2) Surveying and practice (first semester in the third year).

Web Sites

Additional Information

30250

Concrete Engineering

Code   30250   Course Year   3rd year   Term   2nd term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description   The basic theory and the design technique of reinforced concrete (RC) and prestressed concrete (PC) structure are explained with the mechanical behavior of the materials introduced in ' Construction Materials' .

Be sure and attend the lecture with your text book. Some homework are assigned to enlarge your knowledge.

Grading   Grading is based on the result of a term-end examination with the homework and attendance.

Course Goals   Students of this class learn to understand the basic theory and the design technique of reinforced concrete (RC) and prestressed concrete (PC) structure, and calculate the resistance and the response of simple RC/PC member.

Course Topics

Theme	Class number of times	Description
Introduction	1	Concrete structure and its characteristic are introduced.
Fundamental of design	2	The design method, the safety factor and etc. are explained.
Structural materials	1	The mechanical behavior of concrete, reinforcing steel and polymer material is explained.
Bond behavior and anchorage	2	The mechanism of bond and anchorage is explained.
Flexural and compression behavior	2	The mechanical behavior and the capacity of RC section subjected to the flexural moment and/or the normal force are explained.
Shear and torsion behavior	2	The mechanical behavior and the capacity of RC section subjected to the shear force and/or the torsional moment are explained.
Crack and deflection	2	The cracks and deflection of RC member are explained.
Verification method of performance over time	1	The verification method of performance over time including the corrosion of the reinforcing steel is explained.
Others	1	The latest research and technique relating to concrete engineering are introduced.
A term-end examination	1	A term-end examination is done during a regular examination period.

Textbook   K. Kobayashi: Concrete Engineering, Morikita Publishing Co., Ltd., 3,150JPY

Textbook(supplemental)

Prerequisite(s)   Students of this class had better take ' Structural Mechanics I and Exercises (30080)' in 2nd year and ' Construction Materials (30240)' in 3rd year.

Web Sites

Additional Information

Heat Transfer

Code   31560   Course Year   3rd year   Term   2nd term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

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

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Earthquake and Wind Resistance of Structures, and Related Structural Design Principles

Code   31500   Course Year   3rd year   Term   2nd term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description   To understand fundamentals of design theory for civil infrastructures. To explain various design loads, including dead load, live load, temperature load, seismic load, and wind load, limit states of structures and their evaluation, demand performance. To design structures considering reliability, optimal design, serviceability, aesthetics, and environment.

Grading   Based on the performance during the course (including homework) and the results of a final examination.

Course Goals   To understand fundamentals of design for civil infrastructures.
To understand fundamentals of load, limit state of structures, reliability design and optimal design.
To understand fundamentals of characteristics of natural wind, aerodynamics of structures, design wind and wind resistant design.
To understand fundamentals of earthquake mechanism and seismic response of structures, seismic load, and seismic design.

Course Topics

Theme	Class number of times	Description
Introduction of design theory of civil infrastructure	2	Design theory of civil infrastructures is introduced. The concept and significance of design, objective of design, characteristics of civil infrastructures, flow of design process, mechanical design, multi-level decision making are discussed. Engineering ethics are also explained.
Introduction of load	3	Design loads for civil infrastructures are introduced. The characteristics and classification of design loads are explained and their quantitative expression is discussed. Especially statistic characteristics of random loads, i.e. seismic load and wind load, are explained.
Prediction of earthquake ground motion and earthquake response of structure	2	Methods for predicting earthquake ground motion are introduced based on the theories of earthquake mechanism and ground vibration. Equation of motion for the single degree of freedom system and its solution are also explained in order to estimate earthquake response of structure. Design methods for infrastructures are interpreted on the basis of theories of elasticity and plasticity.
Characteristics of natural wind and aerodynamics of structures	2	The characteristics of natural wind and strong wind are explained and process of design wind for structures is discussed. And various aerodynamics (vortex-induced vibration, galloping, flutter, buffeting, and etc.) acting on structural section with various geometric shape and their generation mechanism are explained.
Limit state of structure and reliability analysis	3	The outline of structural safety analysis is introduced for serviceability, ultimate and fatigue limit of structures. As for uncertainties in various actions to structures and the resistance of structures, the design methods such as allowable stress method, limit states method with partial safety factors will be discussed in conjunction with reliability analysis.
Seismic design, wind resistant design, optimal design, and landscape design	3	Seismic design, wind resistant design, optimal design and landscape design for various structures, including long span bridge

Textbook   Hand-outs are distributed when necessary.

Textbook(supplemental)

Prerequisite(s)   Probabilistic and Statistical Analysis and Exercises(30030), Dynamics of Soil and Structures(31110), Structural Mechanics I and Exercises(30080), Structural Mechanics II and Exercises(31640), and Fluid Mechanics(31650)

Web Sites

Additional Information   Office hour (contact information and consultation hours) of the individual lecturer will be given in his/her first lecture.

Computer Programming and Experiment on Structural Mechanics

Code 31490　Course Year　3rd year　Term　2nd term　Class day & Period　　Location　　Credits　2
Restriction　No Restriction　Lecture Form(s)　　Language　　Instructor

Course Description　Practical understanding and application of the theory that have been learned in "Structure mechanics　and Exercises" and "Structure mechanics　and Exercises".

To learn the measurment technique on strain, deflection and vibration in experiment, and the fundamentals/application on computer programming for matrix methods for structural analysis in computational exercise which are needed for understanding of the mechanical properties of member and/or structure.

Grading　Grade is given based on attendance and reports.

Course Goals　To understand the fundamentals of measurement of strain, deflection and vibration

To deeply understand theory of structure mechanics by beam experiment

To understand numerical analysis approach of structures by use of matrix methods

To deeply and synthetically understand mechanical behaviors and validation methods of structures by comparing the experimental results with those resulted from matrix methods

Course Topics

Theme	Class number of times	Description
Introduction	2	Explanation of the significance and the role of structural experiment and computer analysis Introduction of relationship among structural mechanics, structural experiment and computer analysis, and examples of practical failure structures
Experiment	10	Introducing fundamentals of experiment method and measurement technique for structure model Experiment of cantilever beam under static load and vibration, and its results and discussion Some practical application cases on techniques of experiment and analyses
Analysis	8	Structural analysis for truss, beam and frame by matrix Calculation of stiffness matrix, steps of formation of stiffness equations and the solution Explanation on a few of attention points of practical numerical approaches and analyses Exercises of computer programming
Analysis on experiment	6	To compare the experimental results with those resulted from computer programming To deeply and synthetically understand mechanical behaviors and validation methods of structures

Textbook　To be distributed in lectures

Textbook(supplemental)

Prerequisite(s)　CompuTer Programming in Global Engineering, Structure mechanics　and Exercises, Structure mechanics　and Exercises

Web Sites

Additional Information　Office hour (contact information and consultation hours) of the individual lecturer will be given in his/her first lecture.

31550

Wave Motions for Engineering

Code   31550   Course Year   3rd year   Term   2nd term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

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

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Spot Training

Code 31470   Course Year 3rd year   Term 2nd term   Class day & Period   Location   Credits 2

Restriction   No Restriction   Lecture Form(s)   Exercise   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Global Engineering for Disaster Reduction

Code   30880   Course Year   4th year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description   Civil Engineering manages basic built environments in our society, which maintains quality of civic life, and save life and properties. This lecture discusses the role of civil engineering as the basic elements based on Business Continuity Management and Critical Infrastructure Protection concept.

Grading   Mini reports after each lectures, and the end of semester reports examination

Course Goals   Acquiring basic the understanding about CIP   Critical Infrastructure Protection   and BCP (Business Continuity Planning)

Course Topics

Theme	Class number of times	Description
Definition of Critical Infrastructure	3	Definition and history of Critical Infrastructure will be discussed.
What is resiliency?	2	Definition of resiliency and possible future of society with high resiliency will be explained.
Business Continuity Planning	3	Concept of BCP, Risk and Crisis, BCP and countermeasures for BCP will be explained.
Business continuity of Critical Infrastructures	7	Countermeasures for business continuity of Water supply system, communication network, energy, transportation, finance, logistics, and public administration will be explained.

Textbook   none

Textbook(supplemental)   Kyoto University, NTT resilience research group, Creating resilient society, Nikkei BP, 2009 (in Japanese)

Prerequisite(s)   Both natural and social science interests required.

Web Sites

Additional Information

Construction Materials, Laboratory

Code 30860 Course Year 4th year Term 1st term Class day & Period Location Credits 2

Restriction No Restriction Lecture Form(s) Language Instructor

Course Description Experiments on the materials for concrete and concrete member are carried out in the main. Properties of concrete materials and member are discussed by using those experimental results.

Be sure and attend the laboratory with your experimental text book. The schedule and details of the experiment are announced at the initial lecture. Students of this laboratory class have to attend an initial lecture because they are to be divided into some groups.

Grading A report with the experimental results and discussion is assigned in each time. The grading is based on the total point of reports and attendance.

Course Goals Students of this class practically learn to understand the properties of concrete material and member introduced in 'Construction Materials' and 'Concrete Engineering', and its measurement technique.

Course Topics

Theme	Class number of times	Description
Introduction	1	The objective and contents of this laboratory are introduced. The fundamentals of the measuring and testing method are also introduced.
Cement	1	The density, the fineness and the setting time of cement, and the flow of mortar are tested.
Aggregate	1	The density, the water absorption ratio, the grading, unit mass and surface water ratio of fine and coarse aggregate are tested.
Mix proportion design of concrete and fresh concrete		Mix proportion of concrete is designed using the results of 'cement' and 'aggregate'. The condition of fresh concrete made by using the designed mix proportion is examined. The test specimens for 'hardened concrete' are also cast.
Hardened concrete	2	Some destructive and non-destructive tests are performed in the test specimens cast in 'fresh concrete'.
Reinforcing steel bar	1	The yield strength, the tensile strength and the elongation are obtained in the reinforcing steel bar for concrete.
Design of reinforced concrete (RC) and prestressed concrete (PC) beam	3	The reinforced concrete (RC) and prestressed concrete (PC) beam are designed.
Casting of RC and PC beam	1	The designed RC and PC beam specimens are cast.
Prestressing	1	The prestress is introduced in PC beam by post tensioning system.
Loading test of RC and PC beam	2	Loading test for RC and PC beam specimens is carried out. The flexural behavior of RC and PC beam is investigated, comparing the experimental loading capacity with the designed one.
Topics	1	The latest research and/or technique of concrete are introduced.
A term-end examination	0	A term-end examination is not done.

Textbook The Society of Materials Science, Japan: Construction Materials Laboratory, 1,600JPY

Textbook(supplemental)

Prerequisite(s) Members of this class had better take 'Construction Materials (30240)' and 'Concrete Engineering (30250)' in 3rd year.

Web Sites

Additional Information

Time Series Analysis

Code 31610 Course Year 4th year Term 1st term Class day & Period Location Credits 2

Restriction No Restriction Lecture Form(s) Language Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Design Practice A for Global Engineering

A

Code　31770　Course Year　4th year　Term　1st term　Class day & Period　　Location　　Credits　2

Restriction　No Restriction　Lecture Form(s)　　Language　　Instructor

Course Description　In the first half of the class, it aims to understand the principle of the structural design from both technical and formative points of view, and cmprehend the practical design of structures and landscapes. In the latter half of the class, it aims to understand the ways of designing spaces and landscapes by design practice as tracing plans and cross sections, and analyzing well-designed cases.

Grading　Total points will be scored in design practice and reports.

Course Goals　To understand the ways of designing of landscape design. To acquiring basic skills of landscape design.

Course Topics

Theme	Class number of times	Description
Guidance	1	Guidance
Foundation and practice for civil engineering design	5	Lectures on the practical design of Bridges, Roads, Riversides; focusing on design skills and the structural system; materials; and the soil conditions.
Practice of tracing drawings	2	Learning graphics of drafting lines and landscape elements, which are important to conceive and display designs. Practice of tracing drawings to understand the rolls of drawings, and acquire the sense of scale.
Space unit and functional space	2	Learning a basis of compositions of space, and an idea of unit space, and its scale and functions.
Design study	4	Practicing an actual design work of small open space or public facility, by making a design concept and visual images.

Textbook

Textbook(supplemental)

Prerequisite(s)　It is desirable to have taken the class of " Urban and Landscape Design"

Web Sites

Additional Information　Office hours are not especially set. Ask any questions by mailing or visiting professors (Kawasaki, rm.202; Kubota, rm.201, C1-1 at Katsura Campus). The theme of design practice could be changed partially.

31790

Design Exercise for Global Engineering C

C

Code   31790   Course Year   4th year   Term   1st term   Class day & Period   Location   Credits   1

Restriction   No Restriction   Lecture Form(s)   Seminar   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

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

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Earth Resources and Ocean Energy

Code   31590   Course Year   4th year   Term   1st term   Class day & Period   Location   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

30840

Administration of Public Works

Code   30840   Course Year   4th year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description   This course will outline the overview of the existing laws on administration of public works and explain their implication to nation building, community development, and civil engineering facilities as well as practice in planning, construction, management, and operation.

Grading   The final grade will be determined based on a comprehensive assessment of the final examination, papers, and other assignments.

Course Goals   The objective of this course is to gain an understanding of the existing laws on administration of public works, their implications to nation building, community development, and civil engineering facilities, and practice in planning, construction, management, and operation.

Course Topics

Theme	Class number of times	Description

Textbook   Handouts to be distributed.

Textbook(supplemental)   Oka, Shohei. " " Gihodo Shuppan (1989)
  Oka, Shohei. " " Sankaido (1995)

Prerequisite(s)

Web Sites

Additional Information

Underground Development Engineering

Code   31200   Course Year   4th year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Lecture   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
	1	
	3	
	4	
	5	
	1	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Design Exercise for Global Engineering B

B

Code   31780   Course Year   4th year   Term   1st term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

Introduction to Architectural Engineering

Code 30890 Course Year 4th year Term 2nd term Class day & Period Location Credits 2

Restriction No Restriction Lecture Form(s) Language Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
	4	
	3	
	3	
	4	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

21050

Engineering Ethics

Code   21050   Course Year   4th year   Term   2nd term   Class day & Period   Location   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

Global Leadership (Introduction)

Code   21010   Course Year   1st year   Term   Class day & Period   Location   Credits   2

Restriction   No Restriction   Lecture Form(s)   Language   Instructor

Course Description

Grading

Course Goals

Course Topics

Theme	Class number of times	Description
	1~3	
	4	
	5~15	

Textbook

Textbook(supplemental)

Prerequisite(s)

Web Sites

Additional Information

22000

Global Leadership (Exercise in English)

Code 22000   Course Year 2nd year   Term   Class day & Period   Location   Credits 1   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

Global Leadership (Engineering and Ecology)

Code 22100 Course Year 2nd year Term 1st term Class day & Period Location Credits 1

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

22200

Global Leadership (Engineering and Economy)

Code   22200   Course Year   2nd year   Term   2nd term   Class day & Period   Location   Credits   1

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

Global Leadership (Advanced Seminar　)

Code 24000   Course Year 3rd year   Term   Class day & Period   Location   Credits 1   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

25000

Global Leadership (Advanced Seminar　)

Code　25000　Course Year　4th year　Term　　Class day & Period　　Location　　Credits　1　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

2010

[A] Global Engineering

[B] Architecture

[C] Engineering Science

[D] Electrical and Electronic Engineering

[E] Informatics and Mathematical Science

[F] Industrial Chemistry

`http://www.t.kyoto-u.ac.jp/syllabus-s/`

2010.4