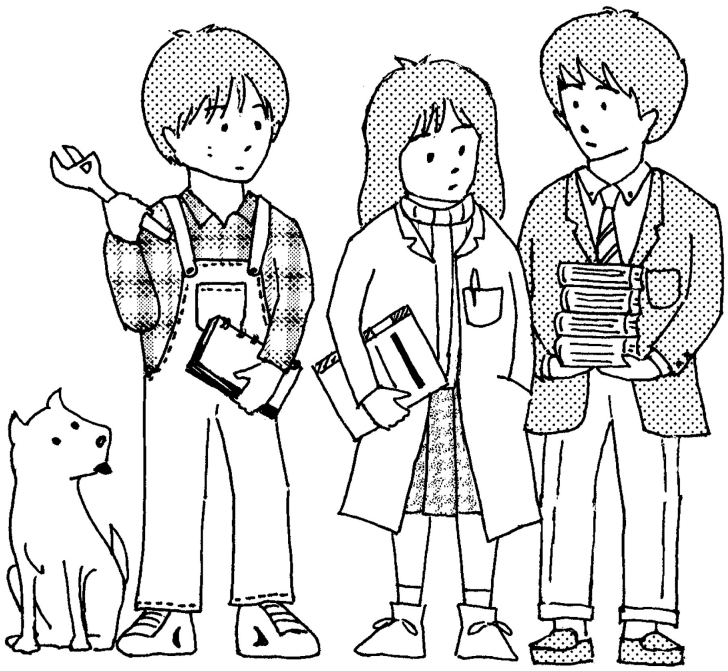
SYLLABUS *2018*

[A] Common Subjects of Graduate School of Engineering



Kyoto University, Graduate School of Engineering

[A] Common Subjects of Graduate School of Engineering

Common Subject

Japanese Language Classes

10i051

Frontiers in Modern Scinece and Technology (6H course)

現代科学技術の巨人セミナー「知のひらめき」（6H コース）

【Code】10i051 【Course Year】Doctor Course 【Term】First term, intensive

【Class day & Period】Intensive (Saturday, Jun.-Jul) 【Location】B-Cluster 2F Seminar Room 【Credits】0.5

【Restriction】Student number will be limited. 【Lecture Form(s)】Intensive Lecture 【Language】Japanese

【Instructor】GL center: J.Assoc. Tanaka, Matsumoto, Ashida, Maeda and Related professors

【Course Description】This course provides lectures and panel discussions by lecturers inside and outside the campus who have a remarkable achievement in engineering and are active as international leaders.

【Grading】Separate four classes will be provided. One class has three hours. Each class will assign a report. Evaluation bases on the assignment and class contribution. The classes will be opened on Saturdays. In 6H course, students have to select two classes and will earn 0.5 credits.

【Course Goals】This course cultivates the ability to develop familiar problem consciousness into a big concept through utilizing the materials of advanced fields in each field. This course also shows how leaders have improved their response to problems. Through this course, students learn fundamental culture, and the importance of human growth.

【Course Topics】

Theme	Class number of times	Description
Topic 1	2	Detail will be announced later
Topic 2	2	Detail will be announced later

【Textbook】Course materials will be provided.

【Textbook(supplemental)】

【Prerequisite(s)】

【Independent Study Outside of Class】

【Web Sites】

【Additional Information】

10i052

Frontiers in Modern Scinece and Technology (12H course)

現代科学技術の巨人セミナー「知のひらめき」（12H コース）

【Code】10i052 【Course Year】Doctor Course 【Term】First term/Spring term

【Class day & Period】Intensive (Saturday, Jun.-Jul) 【Location】B-Cluster 2F Seminar Room 【Credits】1

【Restriction】Student number will be limited. 【Lecture Form(s)】Intensive Lecture 【Language】Japanese

【Instructor】GL center: J.Assoc. Tanaka, Matsumoto, Ashida, Maeda and Related professors

【Course Description】This course provides lectures and panel discussions by lecturers inside and outside the campus who have a remarkable achievement in engineering and are active as international leaders.

【Grading】Separate four classes will be provided. One class has three hours. Each class will assign a report. Evaluation bases on the assignment and class contribution. The classes will be opened on Saturdays. In 12H course, students have to complete all four classes and will earn 1 credits.

【Course Goals】This course cultivates the ability to develop familiar problem consciousness into a big concept through utilizing the materials of advanced fields in each field. This course also shows how leaders have improved their response to problems. Through this course, students learn fundamental culture, and the importance of human growth.

【Course Topics】

Theme	Class number of times	Description
Topic 1	2	Detail will be announced later
Topic 2	2	Detail will be announced later
Topic 3	2	Detail will be announced later
Topic 4	2	Detail will be announced later

【Textbook】Course materials will be provided.

【Textbook(supplemental)】

【Prerequisite(s)】

【Independent Study Outside of Class】

【Web Sites】

【Additional Information】

10i045

Exercise in Practical Scientific English Ⅰ

実践的科学英語演習Ⅰ

【Code】10i045 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Thu 4th or 5th 【Location】A2-304

【Credits】1 【Restriction】Up to 20 students for each class 【Lecture Form(s)】Seminar 【Language】English (Japanese)

【Instructor】M. Nishikawa, R. Matsumoto, R. Ashida, M. Maeda,

【Course Description】This course is open to all master and doctoral engineering students. It is designed to help students understand how to write a research paper step by step. In this course, the students will write a short research paper (i.e. Extended Research Abstract for Proceeding. approx. 1000 -1500 words) on a topic drawn from assigned readings.

【Grading】Evaluation based on 30% participation, 40% reports, 30% final paper *More than twice unexcused absence can result in course failure

【Course Goals】The primary goal of this course is to deepen an understanding of the main features of each part of a scientific paper (IMRaD). Throughout the course, students will develop the core competencies required for language, grammar, and style to produce a research manuscript in English.

【Course Topics】

Theme	Class number of times	Description
Unit 1: Course Overview	1	Course Overview: Introduction to writing scientific research articles
Unit 2: Introduction	1	Raising awareness of the register of science research articles (genre, audience, purpose)
Unit 3: Preparing to Write	1	Writing a proposal for a research paper, using corpus-based approach (Exercise: Creating own Corpus)
Unit 4: Preparing to Write	1	Paraphrasing ideas from source texts, using citations and references in formal writing
Unit 5: Writing Processes	1	Identifying the“ moves ”for an Abstract section by hint expressions
Unit 6: Writing Processes	1	Writing an Abstract (Title) & peer feedback
Unit 7: Writing Processes	1	Identifying the“ moves ”for an Introduction section by hint expressions
Unit 8: Writing Processes	1	Writing an Introduction section & peer feedback
Unit 9: Writing Processes	1	Writing a Method section & peer feedback
Unit 10: Writing Processes	1	Writing a Result section & peer feedback
Unit 11: Writing Processes	1	Writing a Discussion and a Conclusion section
Unit 12: Writing Processes	1	Writing a cover letter to reviewers and how to respond to reviewers
Unit 13: Monitoring and Revising	1	Online feedback
Unit 14: Monitoring and Revising	1	Revising a paper based on peer feedback
Unit 15: Submission	1	Final Paper Due, August 6.

【Textbook】Handout materials will be supplied by the instructor.

【Textbook(supplemental)】ALESS (2012). Active English for Science- 英語で科学する - レポート、論文、プレゼンテーション . The University of Tokyo Press. Cargill, M., & O'Connor, P. (2013). Writing scientific research articles: Strategy and steps. John Wiley & Sons. Cowell, R., & She, L. (2015). Mastering the Basics of Technical English『技術英語の基礎』. 2nd Ed., Corona Publishing. 野口ジュディー・深山晶子・岡本真由美 .（2007）.『理系英語のライティング』. アルク

【Prerequisite(s)】Students who intend to join this course must attend the first class.

【Independent Study Outside of Class】

【Web Sites】

【Additional Information】We may restrict the class size to enhance students’ learning. Students who intend to join the course are required to attend the first-day guidance. Office Hours: (by appointment) nishikawa.mikako7w@kyoto-u.ac.jp (Ext. 2052)

10i046

Exercise in Practical Scientific English Ⅱ

実践的科学英語演習Ⅱ

【Code】10i046 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 5th
【Location】Seminar Room at Cluster B, Katsura campus 【Credits】1
【Restriction】If the number of students in this course reaches the enrollment limit after the web-registration, a drawing will take place to decide who gets to be enrolled in the first class.
【Lecture Form(s)】Seminar and Exercise 【Language】English
【Instructor】Engineering Education Research Center (M. Nishikawa), Related professors (J. Lintuluto, A. Beaucamp, C. Tassel, K. Landenberger, M. De Zoysa)
【Course Description】This course is open to all master and doctoral engineering students. The aim is to enhance students' abilities to disseminate scientific findings to a wider audience in English. Throughout the course, feedback will be given to the presenter by different instructors specialized in Engineering. The course will help students gain confidence in Oral English presentations on scientific topics.
【Grading】Evaluation: 20% participation (engaging the Q&As), 10% reflection paper, 10% poster presentation, 60% oral presentations
【Course Goals】Throughout the course, students are expected to deliver an oral presentation about their research three times. In each class, four or five students (depending on the total number of students in class) will deliver a 10-minutes oral presentation using the visual aid in front of a small group. After each presentation, the audience, and the instructor(s) in the class will give some meaningful feedback (5 min). In addition, each presentation will be videotaped and stored in USB memory. Students can monitor the progress by watching own video and can write a reflection paper at the end of the course. In addition, we will have poster presentations scheduled during the course.
【Course Topics】

Theme	Class number of times	Description
Introduction: Effective Presentation	1	A lecture is given on how to prepare an effective presentation including: 1. Presenting with purpose, 2. How to organize your message, 3. How to use transitional words and phrases, 4. What to do for Questions and Answers.
Oral presentations	12	Here are some focal points for each round of oral presentations: 1. Organization-Presentation should be structurally organized and contains information in logical, interesting sequence which audience can follow, 2. Subject Knowledge-Students should be able to demonstrate the knowledge on the research topic with some degree of confidence, 3. Delivery: Students should be able to deliver a presentation that will merit the audience even if the audience does not come from the same research field.
Poster presentations	2	Here are some criteria for poster presentations: 1. Layout of information-The sequence of information should be logically organized and easy to follow, 2. Scientific knowledge-The poster should provide a content suitable for non-experts, 3. Delivery-Students need to demonstrate knowledge and enthusiasm for their work.

【Textbook】Handout materials will be supplied by the instructor.
【Textbook(supplemental)】Donovan, J. (2014). How to deliver a TED talk. Mc Graw, Hill Education.
【Prerequisite(s)】This course is held in English. Students are expected to actively engage in class discussions.
【Independent Study Outside of Class】
【Web Sites】None
【Additional Information】Students who intend to join this course must attend the first class.
Office Hours: (by appointment) nishikawa.mikako7w@kyoto-u.ac.jp (Ext. 2052)

10i053

Introduction to Advanced Material Science and Technology (11 times course) (English lecture)

先端マテリアルサイエンス通論（11 回コース）（英語科目）

【Code】10i053 【Course Year】Master and Doctor Course 【Term】Spring term 【Class day & Period】Fri 5th 【Location】A2-306 【Credits】1.5
【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture 【Language】English
【Instructor】ER Center, J. Assoc. Prof., Ryuichi Ashida
Related professors
【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】The average score of the best four reports is employed.
Please go to KULASIS Web site for more information.
【Course Goals】
【Course Topics】

Theme	Class number of times	Description
Tumor Imaging and Therapy through Photoirradiation	1	The overview of current modalities through photoirradiation as well as the preparation of tumor imaging probes is given. Tumor therapy through photoirradiation is also shown in the lecture. (K. Miki: Dept. of Energy and Hydrocarbon Chemistry)
Carbon Nanorings	1	The preparation of carbon nanorings is outlined in the lecture. The supramolecular interaction as well as the photophysical properties of carbon nanorings is summarized. (K. Miki: Dept. of Energy and Hydrocarbon Chemistry)
Crystal Structure Analysis by Powder X-ray Diffraction Measurement	1	Chemical and physical properties of a material is strongly related with the structure of the material. So, structure analysis is one of the most important part in material researches. Powder X-ray diffraction analysis is powerful way to analyze the crystal structure of solid materials. We study how to use powder X-ray diffraction analysis for material researches. (T. Yamamoto: Dept. of Energy and Hydrocarbon Chemistry)
Principles and Applications of Fluorescenece Spectroscopy	1	Fluorescence spectroscopy is applied to various disciplines of science and engineering, and provides unique information of a system upon photo-illumination. This course aims to introduce the background of fluorescence spectroscopy and practical knowledge in fluorescence experiments. (J. Park: Dept. of Molecular Engineering)
Synthesis of Novel π -Conjugated Molecules with Main Group Elements	1	The lecture will show synthesis and properties of novel π -conjugated molecules with main group elements, and their application as functional materials. (T. Higashino: Dept. of Molecular Engineering)
Chemistry of Asymmetric Catalysis ―Stereoselective Synthesis of Optically Active Pharmaceutical Compounds	1	This class will outline the progress on enantioselective catalysis for the asymmetric synthesis of optically active pharmaceutical compounds such as Herbesser, which is a blockbuster drug developed in a Japanese pharmaceutical company. (K. Asano: Dept. of Material Chemistry)
Electrical Conductivity of Conjugated Polymers and Application to Organic Electronics	1	In this class, structure and property of conjugated polymers are introduced and discussed. The discussion topics include the brief history of the discovery of electrical conductivity of conjugated polymers, mechanism of electrical conductivity in polymer chains, representative evaluation methods of conductivity for conjugated polymers, relationship between molecular and self-assembled structures of conjugated polymers, and recent examples of device applications using conjugated polymers. (I. Sakurai: Dept. of Molecular Engineering)
An Introduction to Smart Shape Changing Materials	1	This course will briefly introduce smart materials as a whole and will then focus specifically on the recent and very active field of smart shape changing materials. We will explore how the design and stimuli-sensitivity of various materials can allow for materials to have planned and useful motion. (K. Landenberger: Dept. of Polymer Chemistry)
Properties of Cementitious Materials and the Future	2	CEMENT may not necessarily be an advanced material, but must surely be a forefront material for human life and society, in the past, present and future. Then, what are your demands to cement? (A. Hattori: Dept. of Urban Management)
Application of Electrical Discharge to Material and Environmental Technology	1	(N. Sano: Dept. of Chemical Engineering)

【Textbook】None
【Textbook(supplemental)】
【Prerequisite(s)】
【Independent Study Outside of Class】
【Web Sites】
【Additional Information】

10i054

Introduction to Advanced Material Science and Technology (15 times course) (English lecture)

先端マテリアルサイエンス通論（15 回コース）（英語科目）

【Code】10i054 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Fri 5th 【Location】A2-306 【Credits】2 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture

【Language】English

【Instructor】ER Center, J. Assoc. Prof., Ryuichi Ashida
Related professors

【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】The average score of the best five reports is employed.
Please go to KULASIS Web site for more information.

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Tumor Imaging and Therapy through Photoirradiation	1	The overview of current modalities through photoirradiation as well as the preparation of tumor imaging probes is given. Tumor therapy through photoirradiation is also shown in the lecture. (K. Miki: Dept. of Energy and Hydrocarbon Chemistry)
Carbon Nanorings	1	The preparation of carbon nanorings is outlined in the lecture. The supramolecular interaction as well as the photophysical properties of carbon nanorings is summarized. (K. Miki: Dept. of Energy and Hydrocarbon Chemistry)
Crystal Structure Analysis by Powder X-ray Diffraction Measurement	1	Chemical and physical properties of a material is strongly related with the structure of the material. So, structure analysis is one of the most important part in material researches. Powder X-ray diffraction analysis is powerful way to analyze the crystal structure of solid materials. We study how to use powder X-ray diffraction analysis for material researches. (T. Yamamoto: Dept. of Energy and Hydrocarbon Chemistry)
Principles and Applications of Fluorescenece Spectroscopy	1	Fluorescence spectroscopy is applied to various disciplines of science and engineering, and provides unique information of a system upon photo-illumination. This course aims to introduce the background of fluorescence spectroscopy and practical knowledge in fluorescence experiments. (J. Park: Dept. of Molecular Engineering)
Synthesis of Novel π -Conjugated Molecules with Main Group Elements	1	The lecture will show synthesis and properties of novel π -conjugated molecules with main group elements, and their application as functional materials. (T. Higashino: Dept. of Molecular Engineering)
Chemistry of Asymmetric Catalysis ― Stereoselective Synthesis of Optically Active Pharmaceutical Compounds	1	This class will outline the progress on enantioselective catalysis for the asymmetric synthesis of optically active pharmaceutical compounds such as Herbesser, which is a blockbuster drug developed in a Japanese pharmaceutical company. (K. Asano: Dept. of Material Chemistry)
Electrical Conductivity of Conjugated Polymers and Application to Organic Electronics	1	In this class, structure and property of conjugated polymers are introduced and discussed. The discussion topics include the brief history of the discovery of electrical conductivity of conjugated polymers, mechanism of electrical conductivity in polymer chains, representative evaluation methods of conductivity for conjugated polymers, relationship between molecular and self-assembled structures of conjugated polymers, and recent examples of device applications using conjugated polymers. (I. Sakurai: Dept. of Molecular Engineering)
An Introduction to Smart Shape Changing Materials	1	This course will briefly introduce smart materials as a whole and will then focus specifically on the recent and very active field of smart shape changing materials. We will explore how the design and stimuli-sensitivity of various materials can allow for materials to have planned and useful motion. (K. Landenberger: Dept. of Polymer Chemistry)
Properties of Cementitious Materials and the Future	2	CEMENT may not necessarily be an advanced material, but must surely be a forefront material for human life and society, in the past, present and future. Then, what are your demands to cement? (A. Hattori: Dept. of Urban Management)
Application of Electrical Discharge to Material and Environmental Technology	1	(N. Sano: Dept. of Chemical Engineering)
Theory of Precision Cutting, Grinding, Polishing and Related Properties of Materials	1	Fine finishing of surfaces is of critical importance to a wide range of science and technology, from lens and mirror based optical and communication systems, to sliding and rolling contact surfaces required in orthopedic, automotive, aeronautics, and high-precision equipment. Across two lectures, the machinability of materials and methods to obtain precise and smooth surfaces will be explored, as well as the metrology (measuring equipment) that enables quality control and process feedback. (A. Beucamp: Dept. of Micro Engineering)
Metrology and Control Theory for Precision Manufacturing, and Applications	1	Fine finishing of surfaces is of critical importance to a wide range of science and technology, from lens and mirror based optical and communication systems, to sliding and rolling contact surfaces required in orthopedic, automotive, aeronautics, and high-precision equipment. Across two lectures, the machinability of materials and methods to obtain precise and smooth surfaces will be explored, as well as the metrology (measuring equipment) that enables quality control and process feedback. (A. Beucamp: Dept. of Micro Engineering)
Fabrication of Inorganic Nanofiber by Electrospinning	1	When a high voltage is applied to a polymer solution, the solution is sprayed as thread-like droplets, and turns to polymer nanofibers. This fiber forming technique is called electrospinning. This lecture will give a brief introduction on the fabrication of nanofibers of inorganic materials including metal oxide and carbon by electrospinning. (S. Nagamine: Dept. of Chemical Engineering)
Solid Surface Analysis, Including a Potential Method: Tip-Enhanced Raman Spectroscopy	1	Surface analytical techniques each have their own analytical volume. The students learn about the volume, and look at an issue for tip-enhanced Raman spectroscopy, a nanoscale Raman spectroscopy, as a potential surface analytical technique. (M. Nishi: Dept. of Material Chemistry)

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Independent Study Outside of Class】

【Web Sites】

【Additional Information】

10i055

Advanced Modern Science and Technology (4 times course)（English lecture）

現代科学技術特論（4 回コース）(英語科目)

【Code】10i055 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 5th 【Location】A2-306 【Credits】0.5 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture 【Language】English

【Instructor】 ER Center, J. Assoc. Prof., Ashida
ER Center, J. Assoc. Prof., Matsumoto
ER Center, J. Assoc. Prof., Maeda
ER Center, J. Assoc. Prof., Yorozu
Related professors

【Course Description】Engineering/Engineers have been expected to fulfill key roles among social issues and others, such as energy, environment and resource. This class introduces cutting edge science and technologies from their backgrounds, research and development, to problems for the practical applications. In addition to the understanding of each technology, the attendances learn the importance for engineers to have multidisciplinary mind and understand the significance of engineering to realize sustainable development. Group discussions will be done for further understanding of the topics of the course.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Computer-Aided Analyses for Fluid (11/1)	1	Lagrangian Meshfree Methods as New Generation Computational Tools (A. Khayyer: Dept. of Civil and Earth Resources Engineering)
Computer-Aided Analyses for Fluid (11/8)	1	Lagrangian Meshfree Methods as New Generation Computational Tools (A. Khayyer: Dept. of Civil and Earth Resources Engineering)
Computer-Aided Analyses for Fluid (11/15)	1	CFD in Process Systems Engineering (O. Tonomura: Dept. of Chemical Engineering)
Computer-Aided Analyses for Fluid (11/29)	1	CFD in Hydraulic Engineering (K. Yorozu: ER Center)
Utilization of Light Energy (12/6)	1	Photochemistry of Organic Molecules (T. Umeyama: Dept. of Molecular Engineering)
Utilization of Light Energy (12/13)	1	Photochemistry of Organic Molecules (T. Umeyama: Dept. of Molecular Engineering)
Utilization of Light Energy (12/20)	1	Solar Energy Conversion Using Semiconductor Photocatalysts (M. Higashi: Dept. of Energy and Hydrocarbon Chemistry)
Utilization of Light Energy (12/27)	1	Efficiency Improvement in Solar Cells by Photonic Nano Structures (Y. Tanaka: Photonics and Electronics Science and Engineering Center)

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Independent Study Outside of Class】

【Web Sites】

【Additional Information】There are two topics, each of which consists of four lectures. Students who take '4 times course' should select one of the topics and attend the lectures. (Students who take '8 times course' should attend the lectures of the both topics.) Attend a course orientation held before the first lecture (Nov. 1) even if you take only the second topic.

10i056

Advanced Modern Science and Technology (8 times course)（English lecture）

現代科学技術特論（8 回コース）(英語科目)

【Code】10i056 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Thu 5th 【Location】A2-306 【Credits】1 【Restriction】No Restriction 【Lecture Form(s)】Relay Lecture 【Language】English

【Instructor】 ER Center, J. Assoc. Prof., Ashida
ER Center, J. Assoc. Prof., Matsumoto
ER Center, J. Assoc. Prof., Maeda
ER Center, J. Assoc. Prof., Yorozu
Related professors

【Course Description】Engineering/Engineers have been expected to fulfill key roles among social issues and others, such as energy, environment and resource. This class introduces cutting edge science and technologies from their backgrounds, research and development, to problems for the practical applications. In addition to the understanding of each technology, the attendances learn the importance for engineers to have multidisciplinary mind and understand the significance of engineering to realize sustainable development. Group discussions will be done for further understanding of the topics of the course.

【Grading】

【Course Goals】

【Course Topics】

Theme	Class number of times	Description
Computer-Aided Analyses for Fluid (11/1)	1	Lagrangian Meshfree Methods as New Generation Computational Tools (A. Khayyer: Dept. of Civil and Earth Resources Engineering)
Computer-Aided Analyses for Fluid (11/8)	1	Lagrangian Meshfree Methods as New Generation Computational Tools (A. Khayyer: Dept. of Civil and Earth Resources Engineering)
Computer-Aided Analyses for Fluid (11/15)	1	CFD in Process Systems Engineering (O. Tonomura: Dept. of Chemical Engineering)
Computer-Aided Analyses for Fluid (11/29)	1	CFD in Hydraulic Engineering (K. Yorozu: ER Center)
Utilization of Light Energy (12/6)	1	Photochemistry of Organic Molecules (T. Umeyama: Dept. of Molecular Engineering)
Utilization of Light Energy (12/13)	1	Photochemistry of Organic Molecules (T. Umeyama: Dept. of Molecular Engineering)
Utilization of Light Energy (12/20)	1	Solar Energy Conversion Using Semiconductor Photocatalysts (M. Higashi: Dept. of Energy and Hydrocarbon Chemistry)
Utilization of Light Energy (12/27)	1	Efficiency Improvement in Solar Cells by Photonic Nano Structures (Y. Tanaka: Photonics and Electronics Science and Engineering Center)

【Textbook】None

【Textbook(supplemental)】

【Prerequisite(s)】

【Independent Study Outside of Class】

【Web Sites】

【Additional Information】There are two topics, each of which consists of four lectures. Students who take '8 times course' should attend the lectures of the both topics. (Students who take '4 times course' should select one of the topics and attend the lectures.)

10i041

Professional Scientific Presentation Exercises（English lecture）

科学技術者のためのプレゼンテーション演習（英語科目）

【Code】10i041 【Course Year】Doctor Course 【Term】1st term 【Class day & Period】Thu 5th
【Location】B-Cluster 2F Seminar Room 【Credits】1
【Restriction】The number of students might be limited if too many students will get enrolled.
【Lecture Form(s)】Semina ｒ 【Language】English
【Instructor】Juha Lintuluoto, Associate Professor, Department of Synthetic Chemistry and Biological Chemistry
【Course Description】It is imperative for future engineers to be able to communicate and deliver effectively scientific information to large variety of audiences. This skill enables engineers to share and absorb information to more extended audiences, and facilitates success in selling ideas and products, publishing and team working. The purpose of this course is to teach the basic rules needed for successful professional scientific presentation, both orally and written. The course also prepares students to deliver scientific information presentations to wide audiences. The course is consisted of excessive exercises, of which the student should complete seven (7) tasks. The course holds 3-4 tasks for oral presentation exercises, and 3-4 tasks for professional scientific writing exercises. The exact number of both exercises is adjusted for each student’s needs. The course is aimed for doctor course (DC) students, both Japanese and Foreign nationals
【Grading】Reports, class activity, presentation
【Course Goals】This course is aimed to foster engineering students’ scientific presentation skills. The successfully course completed students will be able to express and present complicated and specific scientific information at more generally understandable level. The students will also be able to pose relevant questions and effectively answer to the wide variety of questions.
【Course Topics】

Theme	Class number of times	Description
	1	Guidance and Professional presentation rules and etiquette
	3	Oral presentations & questioning I, Written report I
	3	Oral presentations & questioning I, Written report I
	3	Oral presentations & questioning II, Written report II
	3	Oral presentations & questioning II, Written report II
	2	Oral presentations & questioning III, Written report III
		Oral presentations & questioning III, Written report III
		Oral presentations & questioning IV, Written report IV
		Oral presentations & questioning IV, Written report IV I
		Course summary and discussion

【Textbook】Course materials will be provided.
【Textbook(supplemental)】Will be informed if necessary.
【Prerequisite(s)】-Fundamental skills about scientific presentation
-Advanced English skills
-Sufficient personal research results
【Independent Study Outside of Class】
【Web Sites】The web-site is listed in the home page of the GL education center.
【Additional Information】Students are requested to check in advance whether the credit of this course is counted as the unit for graduation requirement at department level. Course starts at April 12th, and the 1st lesson is repeated on April 19th. The course schedule is irregular. Most classes are biweekly, the detailed schedule is provided at the 1st lecture.

10i042

Advanced Engineering and Economy（English lecture）

工学と経済（上級）（英語科目）

【Code】10i042 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Tue 5th 【Location】B-Cluster 2F Seminar Room 【Credits】2 【Restriction】The number of students might be limited if too many students will get enrolled. 【Lecture Form(s)】Lectures, Group works&tasks 【Language】English 【Instructor】Juha Lintuluoto, Associate Professor, Department of Synthetic Chemistry and Biological Chemistry

【Course Description】Engineering economics plays central role in any industrial engineering project. For an engineer, it is important to apply the engineering know-how with the economic analysis skills to obtain the best available materials, methods, devices, etc. in the most economical way. This course is aimed to teach engineering students the basic economic methods to manage economically an engineering project. In addition, the report writing on various engineering economic issues prepares to write reports in a professional form. The lab sessions are meant for the verbal skills improvement as well as improvement of analytical thinking. The topics are of current relevant topics Small-group brain-storming method is used. The exercise sessions cover the use of Ms-Excel for various quantitative economic analyses.

【Grading】Final test, reports, class activity

【Course Goals】This course is aimed to strengthen engineering students’ skills in economics. The course concept is to teach students selectively those subjects which serve as major tools to solve economic tasks in engineering environment. The reports and lab sessions provide students stimulating and analytical thinking requiring tasks, and presentation skills training is an important part of this course.

【Course Topics】

Theme	Class number of times	Description
Student orientation and Introduction to engineering economy	1	Course contents, goals
Cost concepts and design economics	1	Cost terminology and classification
Cost estimation techniques	1	WBS for cost estimation, estimation techniques (indexes, unit, factor, power-sizing, learning curve, CER, top down, bottom up), target costing
The time value of money	1	Simple interest, compound interest, economic equivalence concept, cash-flow diagrams, PW, FW, AW
Evaluating a single project	1	MARR, present wort method, bond value, capitalized worth, internal rate of return, external rate of return, payback method
Comparison and selection among alternatives	1	Investment and cost alternatives, study period, equal and unequal useful lives, rate-of-return method, imputed market value
Depreciation and income taxes	1	SL and DB depreciation methods, book value, after-tax MARR, marginal income tax rate, gain(loss) on asset disposal, after-tax economic analysis general procedure, EVA,
Price changes and exchange rates	1	Actual dollars, real dollars, inflation, fixed and responsive annuities, exchange rates, purchasing power
Replacement analysis	1	Determining economic life of challenger, determining economic life of defender, abandonment, after-tax replacement study
Evaluating projects with the benefit-cost ratio method	1	Benefits, costs, dis-benefits, self-liquidating projects, multi-purpose projects, interest rate vs. public project, conventional B-C ratio PW and AW method, modified B-C ratio PW and AW method
Breakeven and sensitivity analysis	1	Breakeven analysis, sensitivity analysis, spider plot
Probabilistic risk analysis	1	Sources of uncertainty, discrete and continuous variables, probability trees, Monte Carlo simulation example, decision trees, real options analysis
The capital budgeting process	1	Capital financing and allocation, equity capital and CAPM, WACC, WACC relation to MARR, opportunity cost
Decision making considering multiattributes	1	Non-compensatory models (dominance, satisficing, disjunctive resolution, lexicography), compensatory models (non-dimensional scaling, additive weight)
Final test	1	90 minutes, concept questions, calculation task (option of choice)
		Additionally, students will submit three reports during the course on given engineering economy subjects. Also, required are the five lab participations (ca.60 min/each) for each student. Additionally, three exercise sessions (ca.60 min/each), where use of Ms-Excel will be practiced for solving various engineering economy tasks, should be completed

【Textbook】Engineering Economy 15th ed. William G. Sullivan (2011)

【Textbook(supplemental)】Will be informed if necessary.

【Prerequisite(s)】-This course is highly recommended for those who attend “ Project Management in Engineering course , Small group working method

【Independent Study Outside of Class】

【Web Sites】The web-site is listed in the home page of the GL education center.

【Additional Information】Students are requested to check in advance whether the credits of this course are counted as the units for graduation requirement at department level. The course starts on Oct.2nd.

10i049

Project Management in Engineering

エンジニアリングプロジェクトマネジメント

【Code】10i049 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Fri 4th 【Location】A2-308 【Credits】2
【Restriction】No Restriction 【Lecture Form(s)】Lecture 【Language】English
【Instructor】 GL center: J. Assoc. Prof. Matsumoto, Ashida, Maeda, Yorozu Assoc.Prof. Lintuluoto, J. Assoc. Prof. Tanaka
【Course Description】This course provides a basic knowledge required for the project management in various engineering fields such as process design, plant design, construction, and R&D projects. Also, visiting lecturers from industry and public works provide management insights of actual engineering projects.
【Grading】Evaluated by assignments (project report exercise) and class contribution
【Course Goals】This course will help students gain a fundamental knowledge of what project management in engineering is. Throughout the course, students will learn various tools applied in project management. Students will also understand the importance of costs and money, risks, leadership, and environmental assessment in managing engineering projects. This course is followed with the course Seminar on Project Management in Engineering. in the second semester.
【Course Topics】

Theme	Class number of times	Description
Guidance	1	4/13 (Matsumoto) Course guidance
Special lecture by extramural instructor 1	1	4/20 (Inaoka(JICA)@A2-306) Project management in the case of Japanese ODA
Introduction to project management	1	4/27 (Maeda) Introduction to project management Project phases
Tools for project management I	1	5/11 (Lintuluoto) Tools for project management, cost, and cash flows I
Tools for project management II	1	5/18 (Lintuluoto) Tools for project management, cost, and cash flows II
Tools for project management III	1	5/25 (Lintuluoto) Tools for project management, cost, and cash flows III
Project scheduling I	1	6/1 (Ashida) Project scheduling I
Project scheduling II	1	6/8 (Ashida) Project scheduling II
Leadership I	1	6/15 (Tanaka) Leadership I
Leadership II	1	6/22 (Tanaka) Leadership II
Risk management I	1	6/29 (Matsumoto) Risk management I
Risk management II	1	7/6 (Matsumoto) Risk management II
Environmental Impact Assessment	1	7/13 (Yorozu) Environmental Impact Assessment
Special lecture by extramural instructor 2	1	7/20 (Kumagai(JGC CORPORATION)) To be announced
Feedback	1	7/27 (Matsumoto) Feedback

【Textbook】Course materials will be provided.
【Textbook(supplemental)】1. Lock, Dennis. Project Management. 10th edition. Gower Publishing Ltd.
2. Cleland, David L., and Lewis R. Ireland. Project Management. 5th edition. McGraw-Hill Professional
3. Roger Miller and Donald R. Lessard. The strategic management of large engineering projects, Shaping Institutions, Risks, and Governance, The MIT Press
【Prerequisite(s)】No pre-requisite
【Independent Study Outside of Class】
【Web Sites】The web-site is opened in the home page of the GL education center.
【Additional Information】

10i059

Exercise on Project Management in Engineering

エンジニアリングプロジェクトマネジメント演習

【Code】10i059 【Course Year】Master and Doctor Course 【Term】2nd term

【Class day & Period】Friday 4th period and 5th period 【Location】B-Cluster 2F Seminar Room 【Credits】2

【Restriction】Student number will be limited. 【Lecture Form(s)】Seminar 【Language】English

【Instructor】 GL center: J. Assoc. Prof. Matsumoto, Ashida, Maeda, Yorozu Assoc.Prof. Lintuluoto

【Course Description】In this course, students will apply the engineering know-how and the skills of management, and group leadership which they learned in the course of Project Management in Engineering to build and carry out a virtual inter-engineering project. This course provides a forum where students' team-plan based on ideas and theories, decision making, and leadership should produce realistic engineering project outcomes. The course consists of intensive group work, presentations, and a few intermediate discussions. A written report will be required.

【Grading】Report, class activity, presentation

【Course Goals】This course prepares engineering students to work with other engineers within a large international engineering project. In particular this course will focus on leadership and management of projects along with applied engineering skills where the students learn various compromises, co-operation, responsibility, and ethics.

【Course Topics】

Theme	Class number of times	Description
Guidance	1	10/5 Introduction to Exercise on Project Management in Engineering Lecture on tools for the Project management in engineering Practice
Teamwork	7	Each project team may freely schedule the group works within given time frame. The course instructors are available if any need is required.
Mid-term presentation	1	Each project team will have a mid-term presentation.
Lecture & Teamwork	2	Some lectures will be provided, such as Leadership structuring, Risk Management, and Environmental Impact Assessment, depending on projects you propose.
Presentation	1	Each project team will have a presentation based on its proposed project.

【Textbook】Course materials will be provided.

【Textbook(supplemental)】Will be informed if necessary.

【Prerequisite(s)】Fundamental skills about group leading and communication, scientific presentation.

【Independent Study Outside of Class】

【Web Sites】The web-site will be opened in the home page of the GL education center.

【Additional Information】The number of students may be restricted. Students are requested to check in advance whether the credit from this course will be accepted as a graduation requirement for their department.

10i057

Safety and Health Engineering (4 times course)

安全衛生工学（4 回コース）

【Code】10i057 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 4th

【Location】C3-Lecture Room 1 【Credits】 【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)】

【Independent Study Outside of Class】

【Web Sites】

【Additional Information】

10i058

Safety and Health Engineering (11 times course)

安全衛生工学（11 回コース）

【Code】10i058 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Tue 4th

【Location】C3-Lecture Room 1 【Credits】 【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	

【Textbook】

【Textbook(supplemental)】

【Prerequisite(s)】

【Independent Study Outside of Class】

【Web Sites】

【Additional Information】

10i010

International Internship in Engineering 1

工学研究科国際インターンシップ１

【Code】10i010 【Course Year】Master and Doctor Course 【Term】1st+2nd term

【Class day & Period】Intensive course 【Location】【Credits】1 【Restriction】Defined by each internship program

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

【Instructor】Faculty members in charge of educational affairs of the Global Leadership Engineering Education Center and of the department the registrant belongs to.

【Course Description】Acquisition of international skills with the training of foreign language through the internship programs hosted by the University, the Graduate School of Engineering, or The Department the registrant belongs to.

【Grading】Merit rating is performed based on the presentation or the report(s) after the participation in each internship program. Each department is responsible to identify the number of credits to be granted to the student of the department, if the credits are included in the mandatory ones. The Global Leadership Engineering Education Center takes the role to evaluate the credits if the department the student belongs to deals the credits as optional ones. The number of credits to be earned is 1 and 2, respectively to the subjects International Internship in Engineering 1 and 2 depending on the period and the contents of the internship program the students has participated in.

【Course Goals】Acquisition of international skills with the training of foreign language.

【Course Topics】

Theme	Class number of times	Description
Overseas Internship	1	The contents to be acquired should be described in the brochure of each internship program.
Final Presentation	1	A presentation by the student is required followed by discussion among participants.

【Textbook】Not Applicable

【Textbook(supplemental)】Not Applicable

【Prerequisite(s)】Described in the application booklet for each internship program. The registrant is requested to have enough language skills for the participation.

【Independent Study Outside of Class】Not Applicable

【Web Sites】Not Applicable

【Additional Information】It is required for students to check if the internship program to participate in could be evaluated as part of mandatory credits or not and could earn how many credits before the participation to the department or educational program the student in enrolled. If the credit could not be treated as mandatory ones, get in touch with the Global Leadership Engineering Education Center.

10i011

International Internship in Engineering 2

工学研究科国際インターンシップ２

【Code】10i011 【Course Year】Master and Doctor Course 【Term】1st+2nd term

【Class day & Period】Intensive course 【Location】【Credits】2 【Restriction】Defined by each internship program

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

【Instructor】Faculty members in charge of educational affairs of the Global Leadership Engineering Education Center and of the department the registrant belongs to.

【Course Description】Acquisition of international skills with the training of foreign language through the internship programs hosted by the University, the Graduate School of Engineering, or The Department the registrant belongs to.

【Grading】Merit rating is performed based on the presentation or the report(s) after the participation in each internship program. Each department is responsible to identify the number of credits to be granted to the student of the department, if the credits are included in the mandatory ones. The Global Leadership Engineering Education Center takes the role to evaluate the credits if the department the student belongs to deals the credits as optional ones. The number of credits to be earned is 1 and 2, respectively to the subjects International Internship in Engineering 1 and 2 depending on the period and the contents of the internship program the students has participated in.

【Course Goals】Acquisition of international skills with the training of foreign language. Detailed objectives should be described in each program.

【Course Topics】

Theme	Class number of times	Description
Overseas Internship	1	The contents to be acquired should be described in the brochure of each internship program.
Final Presentation	1	A presentation by the student is required followed by discussion among participants.

【Textbook】Not Applicable.

【Textbook(supplemental)】Not Applicable.

【Prerequisite(s)】Described in the application booklet for each internship program. The registrant is requested to have enough language skills for the participation.

【Independent Study Outside of Class】Not Applicable.

【Web Sites】Not Applicable.

【Additional Information】It is required for students to check if the internship program to participate in could be evaluated as part of mandatory credits or not and could earn how many credits before the participation to the department or educational program the student in enrolled. If the credit could not be treated as mandatory ones, get in touch with the Global Leadership Engineering Education Center.

10i012

Business Japanease Ⅱ A

ビジネス日本語講座Ⅱ A

【Code】10i012 【Course Year】Master and Doctor Course 【Term】1st term 【Class day & Period】Mon 2nd

【Location】B-Cluster 2F Seminar Room 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】Institute for Liberal Arts and Sciences, Part-time Lecturer, Miho Kadonaga

【Course Description】This course aims to develop Japanese language abilities applicable in business situations for advanced Japanese learners who are interested in working for Japanese companies or Japanese-affiliated companies.

【Grading】Evaluation will be based on homework 20%, contribution to the class 30%, and class participation (including manners) 50%.

【Course Goals】To learn vocabulary and honorific expressions used in business.
To deepen your knowledge about Japanese companies.
To learn about the cultural background and the way of thinking underlying the language.

【Course Topics】

Theme	Class number of times	Description
Information I	1	utilization of international human resources
Business phrases in Japanese	2	politeness, differences between the spoken and written languages
Making and receiving telephone calls	2	making inquiries, making appointments, transferring calls, etc.
Writing effective e-mails	3	writing styles for internal and external messages
Types of internal and external documents and their writing styles	2	writing report, proposal. taking the minutes, writing cover letter, request paper, etc.
Information II	1	residence qualification and working permits Japanese social security system
Company visits	1	reception desk, greetings, exchanging name-cards
Greeting visitors	1	at the reception desk, providing directions, seating orders
Information III	1	business practices and the employment system in Japan
Review	1	review

【Textbook】

【Textbook(supplemental)】Handouts will be distributed in class.

【Prerequisite(s)】Advanced level Japanese ability or the equivalent (equivalent to the JLPT N1 or N2 levels)

【Independent Study Outside of Class】Students are expected to apply the skills and knowledge gained in this class to their daily activities.

【Web Sites】

【Additional Information】

10i013

Business Japanese Ⅱ B

ビジネス日本語講座Ⅱ B

【Code】10i013 【Course Year】Master and Doctor Course 【Term】2nd term 【Class day & Period】Mon 2nd

【Location】B-Cluster 2F Seminar Room 【Credits】2 【Restriction】 【Lecture Form(s)】Lecture

【Language】Japanese 【Instructor】Institute for Liberal Arts and Sciences, Part-time Lecturer, Miho Kadonaga

【Course Description】This course aims to develop Japanese language abilities applicable in business situations for advanced Japanese learners who are interested in working for Japanese companies or Japanese-affiliated companies.

【Grading】Evaluation will be based on homework 20%, contribution to the class 30%, and class participation (including manners) 50%.

【Course Goals】To learn basic business styles useful in job hunting.
To learn vocabulary and honorific expressions used in business.
To deepen your knowledge about Japanese companies.
To learn about the cultural background and the way of thinking underlying the language.

【Course Topics】

Theme	Class number of times	Description
Information I	1	international student employment trends in Japan
Effective self-introduction	2	your strengths in college, strong and weak points
Telephone conversations	2	making inquiries, scheduling interviews, etc.
Writing e-mails	2	making inquiries, scheduling interviews, etc.
Information II	1	researching and learning about the business world and companies
Writing application forms, addressing envelope	2	writing entry sheets, CVs, cover letters
Information III	1	written tests, job fairs, joint company information sessions
Preparing for interviews	2	group interviews, individual interviews, group discussions, personal appearance
Information Ⅳ	1	residence qualification, the Japanese social security system
Review	1	Review

【Textbook】

【Textbook(supplemental)】Supplementary material will will be given in class as needed.

【Prerequisite(s)】Advanced level Japanese ability or the equivalent (equivalent to the JLPT N1 or N2 levels)

【Independent Study Outside of Class】Students are expected to practice the skills and knowledge gained to their ordinary activities.

【Web Sites】

【Additional Information】

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・[A] Common Subjects of Graduate School of Engineering
・[B] Master's Program
・[C] Advanced Engineering Course Program
・[D] Interdisciplinary Engineering Course Program
・**オンライン版**　http://www.t.kyoto-u.ac.jp/syllabus-gs/

本文中の下線はリンクを示しています．リンク先はオンライン版を参照してください．

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