

| 科目コード (Code) | 科目名 (Course title) | Course title (English) |
|--------------|-------------------------|---|
| 10C209 | 非鉄製錬学特論 | Non-ferrous extractive metallurgy, Adv. |
| 10C212 | 物質情報工学 | Materials Informatics |
| 10C214 | 凝固・結晶成長学 | Microstructure, solidification and crystal growth |
| 10C267 | セラミックス材料学 | Ceramic Materials Science |
| 10C263 | 結晶物性学特論 | Physical Properties of Crystals Adv. |
| 10C271 | 磁性物理 | Magnetism and Magnetic Materials |
| 10C286 | 原子分子工学特論 | Atomic-molecular scale engineering |
| 10C288 | 材料組織・構造評価学 | Microstructure theory and structure evaluation |
| 10C289 | 先進構造材料特論 | Advanced Structural Metallic Materials |
| 10C290 | 材料電気化学特論 | Electrochemistry for Materials Processing, Adv. |
| 10i061 | 先端マテリアルサイエンス通論 (4回コース) | Introduction to Advanced Material Science and Technology(4 times course) |
| 10i062 | 先端マテリアルサイエンス通論 (8回コース) | Introduction to Advanced Material Science and Technology(8 times course) |
| 10i063 | 先端マテリアルサイエンス通論 (12回コース) | Introduction to Advanced Material Science and Technology(12 times course) |
| 10C273 | 社会基盤材料特論 I | Advanced Materials Science & Engineering in industries I |
| 10C275 | 社会基盤材料特論 II | Advanced Materials Science & Engineering in industries II |
| 10C277 | インターンシップM (材料工学) | Internship in Materials Science & Engineering |
| 10C251 | 材料工学セミナーA | Seminar on Materials Science and Engineering A |
| 10C253 | 材料工学セミナーB | Seminar on Materials Science and Engineering B |
| 10C240 | 材料工学特別実験及演習第一 | Laboratory & Seminar in Materials Scienceand Engineering, Adv. I |
| 10C241 | 材料工学特別実験及演習第二 | Laboratory & Seminar in Materials Scienceand Engineering, Adv. II |
| 88G101 | 研究倫理・研究公正 (理工系) | Research Ethics and Integrity(Scienceand Technology) |
| 88G201 | 学術研究のための情報リテラシー基礎 | Basics of Academic Information Literacy |
| 88G202 | 情報科学基礎論 | Introduction to Information Science |
| 88G301 | 大学院生のための英語プレゼンテーション | Presentation for Graduate Students |
| 10i010 | 工学研究科国際インターンシップ1 | International Internship in Engineering 1 |
| 10i011 | 工学研究科国際インターンシップ2 | International Internship in Engineering 2 |
| 10i049 | エンジニアリングプロジェクトマネジメント | Project Management in Engineering |
| 10i059 | エンジニアリングプロジェクトマネジメント演習 | Exercise on Project Management in Engineering |

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|---|--|---|--|-----------------------------------|---------------------|
| Numbering code | | | | | |
| Course title <English> | 非鉄製錬学特論 Non-ferrous extractive metallurgy, Adv. | Affiliated department, Job title, Name | Graduate School of Engineering Professor, UDA TETSUYA Graduate School of Engineering Associate Professor, TOYOURA KAZUAKI Graduate School of Engineering Associate Professor, TANINOUCHI YUKI | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/First semester |
| Day/period | Fri.2 | Class style | Lecture | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| | | | | | |
| [Course Goals] | | | | | |
| | | | | | |
| [Course Schedule and Contents] | | | | | |
| ,3times, ,1time, ,1time, ,2times, ,1time, , 1 times, ,2times, ,1time, ,2times, ,1time, | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| | | | | | |
| [Textbook] | | | | | |
| | | | | | |
| [Reference books, etc.] | | | | | |
| (Reference books) | | | | | |
| [Regarding studies out of class (preparation and review)] | | | | | |
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| (Others (office hour, etc.)) | | | | | |
| *Please visit KULASIS to find out about office hours. | | | | | |

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|--|---------------------------------|--|---|-----------------------------------|----------------------|
| Numbering code | | | | | |
| Course title <English> | 物質情報工学 Materials Informatics | Affiliated department, Job title,Name | Graduate School of Engineering Professor,KAWAI JIYUN | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/Second semester |
| Day/period | Tue.2 | Class style | Lecture | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| Fourier transform of physical data, data processing such as smoothing, ISO standard of analysis, detection limit, and error will be discussed. | | | | | |
| [Course Goals] | | | | | |
| Learn how to obtain materials information from data measured for your graduate research. | | | | | |
| [Course Schedule and Contents] | | | | | |
| Central limit theorem (Central limit theorem, generating functions, normal distribution, standard deviation)---2 | | | | | |
| Sampling and accuracy (Detection limit, ISO standard)---1 | | | | | |
| Smoothing (Least-squares method, Savitzky-Golay smoothing, peak separation)---1 | | | | | |
| Problem 1. | | | | | |
| Fourier transform (Fourier transform, convolution/deconvolution)---2 | | | | | |
| Problem 2. | | | | | |
| Entropy (Akaike's information criteria, spline function, Tsallis entropy)---2 | | | | | |
| Difference between heat and temperature (Laplace transform)---1 | | | | | |
| Canonical ensemble (Probability and Laplace transform)---1 | | | | | |
| Green function and density matrix (Similarity between Schroedinger equation and diffusion equation)---2 | | | | | |
| JIS and ISO standards---1 | | | | | |
| Materials informatics---1 | | | | | |
| Feedback---1 | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| ----- Continue to 物質情報工学(2) | | | | | |

物質情報工学(2)

[Method, Point of view, and Attainment levels of Evaluation]

Submission of reports.

[Textbook]

Instructed during class

[Reference books, etc.]

(Reference books)

Introduced during class

[Regarding studies out of class (preparation and review)]

Report problems are rather heavy.

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

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|---|--|--|--|-----------------------------------|---------------------|
| Numbering code | | | | | |
| Course title <English> | 凝固・結晶成長学 Microstructure,solidification and crystal growth | Affiliated department, Job title,Name | Graduate School of Engineering Associate Professor,NOSE YOSHITAROU Graduate School of Engineering Professor,HIDEYUKI YASUDA | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/First semester |
| Day/period | Mon.2 | Class style | Lecture | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| To learn science and technologies on solidification and crystal growth, which are fundamentals of processing for fabrication of almost materials. We talk on microstructures during solidification and crystal growth based on kinetics and thermodynamics including phase diagrams. To understand formation mechanism of microstructures in materials such as metals and relationship between microstructures and properties in materials. | | | | | |
| [Course Goals] | | | | | |
| To understand science on solidification and crystal growth. To study a way of considering to control microstructures in materials processing, and to learn formation mechanism of microstructures from the viewpoints of thermodynamics and kinetics. | | | | | |
| [Course Schedule and Contents] | | | | | |
| (1) Introduction 【1 week】 (2) Crystal growth and devices on thin film materials 【6-7 weeks】 (3) Solidification, and selection of microstructures and phases 【6-7 weeks】 (4) Feedback 【1 week】 | | | | | |
| [Class requirement] | | | | | |
| It is desirable to have learned thermodynamics, transport phenomena, microstructures in materials, and corresponding subjects, but it is not necessary. | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| Evaluation will be based on reports and attend. | | | | | |
| [Textbook] | | | | | |
| Utilizing resumes provided in the lecture. | | | | | |
| [Reference books, etc.] | | | | | |
| (Reference books) Introduced during class | | | | | |
| [Regarding studies out of class (preparation and review)] | | | | | |
| To review contents in the last time before the lecture. | | | | | |
| (Others (office hour, etc.)) | | | | | |
| *Please visit KULASIS to find out about office hours. | | | | | |

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|--|--|---|--|-----------------------------------|----------------------|
| Numbering code | | | | | |
| Course title <English> | セラミックス材料学 Ceramic Materials Science | Affiliated department, Job title, Name | Graduate School of Engineering Professor, TANAKA ISAO Graduate School of Engineering Associate Professor, SEKO ATSUTO | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/Second semester |
| Day/period | Thu.2 | Class style | Lecture | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| This lecture covers the mechanical, optical, and electronic properties of ceramics, their microscopic mechanisms, and fundamental knowledge required for the design of ceramics. Applications of advanced experimental and theoretical approaches to ceramic research are also discussed. | | | | | |
| [Course Goals] | | | | | |
| Systematic understanding of the properties of ceramics on macroscopic and microscopic scales and learning approaches to the issues in ceramic research. | | | | | |
| [Course Schedule and Contents] | | | | | |
| Introduction to ceramics, 2times, Overview of the history and commercial applications of ceramics. Fundamentals of ceramics, 4times, Fundamentals of ceramics such as crystal structure, electronic structure, and thermodynamical properties. The atomic and electronic structure of point defects, surfaces, grain boundaries, and their impacts on the properties of ceramics. Structural ceramics, 2times, Mechanical properties of ceramics. Energy ceramics, 2times, Ceramics for energy applications and their understanding from the viewpoint of the atomic and electronic structure. Optical and electronic ceramics, 4times, Optical and electronic properties of ceramics for laser and electronic device applications and their understanding from the viewpoint of the atomic and electronic structure. Assessment of mastery of the course content, 1time, The mastery of the course content is assessed. ” | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| Evaluations are made based on the examination or reports. | | | | | |
| [Textbook] | | | | | |
| | | | | | |
| [Reference books, etc.] | | | | | |
| (Reference books) Yet-Ming Chiang et al., Physical Ceramics (John Wiley amp Sons) | | | | | |
| [Regarding studies out of class (preparation and review)] | | | | | |
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| (Others (office hour, etc.)) | | | | | |
| *Please visit KULASIS to find out about office hours. | | | | | |

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|--|---|---|--|-----------------------------------|----------------------|
| Numbering code | | | | | |
| Course title <English> | 結晶物性学特論 Physical Properties of Crystals Adv. | Affiliated department, Job title, Name | Graduate School of Engineering Professor, INUI HARUYUKI Graduate School of Engineering Associate Professor, KISHIDA KIYOUSUKE | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/Second semester |
| Day/period | Wed.2 | Class style | Lecture | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| Various physical properties of crystalline materials are strongly affected by their crystal symmetry and also by their texture developed through forming and heat-treatment processes. In this course, fundamentals of crystal structure, crystal defects and crystal plasticity as well as their relationship with mechanical and functional properties will be lectured. | | | | | |
| [Course Goals] | | | | | |
| This class aims to help students to acquire fundamentals to control various properties of crystalline materials through understanding the influences of crystal symmetry on various properties of crystalline materials. | | | | | |
| [Course Schedule and Contents] | | | | | |
| (1) Basic theory of elasticity [1 week] (2) Yield criteria and plastic deformation of single crystals [1 week] (3) Plastic deformation of polycrystals [1 week] (4) Fundamentals of texture [1 week] (5) Anisotropic properties of crystalline materials [1 week] (6) Deformation twinning [1 week] (7) Grain boundaries [1 week] (8) Symmetry elements and crystal symmetry [1 week] (9) Crystal symmetry and diffraction [1 week] (10) Intermetallic compounds and lattice defects [1 week] (11) Planar defects in intermetallic compounds [1 week] (12) Dislocations and plastic deformation of intermetallic compounds [1 week] (13) Improvement of plastic deformability of intermetallic compounds [2 week] (14) Feedback | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| Evaluation will be based on individual reports. | | | | | |
| ----- Continue to 結晶物性学特論(2) | | | | | |

結晶物性学特論(2)

[Textbook]

Hand out materials will be provided during the lecture.

[Reference books, etc.]

(Reference books)

山口正治，乾 晴行，伊藤和博 『金属間化合物入門』（内田老鶴圃）ISBN:4-7536-5621-7

[Regarding studies out of class (preparation and review)]

To review contents covered in the previous lecture.

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

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|--|--|---|---|-----------------------------------|----------------------|
| Numbering code | | | | | |
| Course title <English> | 磁性物理 Magnetism and Magnetic Materials | Affiliated department, Job title, Name | Graduate School of Engineering Professor, NAKAMURA HIROYUKI Graduate School of Engineering Associate Professor, TABATA YOSHIKAZU | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/Second semester |
| Day/period | Mon.2 | Class style | Lecture | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| Fundamental magnetism of condensed matters and application of magnetic materials are lectured. | | | | | |
| [Course Goals] | | | | | |
| Systematic understanding of magnetic properties of condensed matters and learning application of magnetic materials | | | | | |
| [Course Schedule and Contents] | | | | | |
| 1. Magnetic moment of atom electronic states and stability of magnetic moment of atom, intra-atomic electron correlations, spin-orbit interaction, crystal-electric field | | | | | |
| 2. Curie and Pauli paramagnetism magnetism in the localized- and itinerant-limited electron systems without spin-spin interactions | | | | | |
| 3-6. Magnetic phase transition in the localized spin system exchange interaction, Heisenberg and Ising models, mean-field approximation, spin wave | | | | | |
| 7-8. Antiferromagnet and other magnetic states antiferromagnet, metamagnetic transition, frustration, quantum spin, topological order | | | | | |
| 9-11. Itinerant electron magnetism Hubbard model, Stoner theory, spin density wave | | | | | |
| 12. Ferromagnetic materials magnetic anisotropy, magnetostriction, magnetic domain, etc. | | | | | |
| 13. Hard and Soft magnets fundamental and application of permanent magnetic materials and soft magnetic materials | | | | | |
| 14. Magnetic record and spintronics fundamental and application of magnetic record and spintronics | | | | | |
| 15. Conclusion | | | | | |
| [Class requirement] | | | | | |
| Fundamental knowledge of quantum mechanics, electromagnetism, thermodynamics, and statistical physics. It is desirable to have already taken "Condensed Matter Physics, 3rd year, Materials Science and | | | | | |
| Continue to 磁性物理(2) | | | | | |

磁性物理(2)

Engineering".

[Method, Point of view, and Attainment levels of Evaluation]

Evaluations are made based on the reports.

[Textbook]

Printed matters will be distributed.

[Reference books, etc.]

(Reference books)

志賀正幸 『材料学シリーズ「磁性入門」』 (内田老鶴圃)

Stephen Blundell 『Magnetism in Condensed Matter (Oxford Master Series in Physics)』 (Oxford University Press)

白鳥紀一・近桂一郎 『磁性学入門』 (裳華房)

[Regarding studies out of class (preparation and review)]

Fundamental knowledge of quantum mechanics, electromagnetism, thermodynamics, and statistical physics.

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

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|---|--|--|---|---------------------------------------|----------------------|
| Numbering code | | | | | |
| Course title <English> | 原子分子工学特論 Atomic-molecular scale engineering | Affiliated department, Job title,Name | Graduate School of Engineering Professor,SUGIMURA HIROYUKI Graduate School of Engineering Associate Professor,KUROKAWA SHIYUU Graduate School of Engineering Associate Professor,ICHII TAKASHI | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/Second semester |
| Day/period | Fri.2 | Class style | Lecture | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
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| [Course Goals] | | | | | |
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| [Course Schedule and Contents] | | | | | |
| ,1time, ,4times, ,5times, ,5times, | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| | | | | | |
| [Textbook] | | | | | |
| | | | | | |
| [Reference books, etc.] | | | | | |
| (Reference books) | | | | | |
| [Regarding studies out of class (preparation and review)] | | | | | |
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| (Others (office hour, etc.)) | | | | | |
| *Please visit KULASIS to find out about office hours. | | | | | |

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|---|--|---|--|-----------------------------------|---------------------|
| Numbering code | | | | | |
| Course title <English> | 材料組織・構造評価学 Microstructure theory and structure evaluation | Affiliated department, Job title, Name | Graduate School of Engineering Professor, MATSUBARA EIICHIROU Graduate School of Engineering Associate Professor, OKUDA HIROSHI Graduate School of Engineering Associate Professor, YUGE KORETAKA | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/First semester |
| Day/period | Tue.2 | Class style | Lecture | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| | | | | | |
| [Course Goals] | | | | | |
| | | | | | |
| [Course Schedule and Contents] | | | | | |
| ,1time, ,2times, ,3times, ,3times, ,2times, ,4times, | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| | | | | | |
| [Textbook] | | | | | |
| | | | | | |
| [Reference books, etc.] | | | | | |
| (Reference books) | | | | | |
| [Regarding studies out of class (preparation and review)] | | | | | |
| | | | | | |
| (Others (office hour, etc.)) | | | | | |
| *Please visit KULASIS to find out about office hours. | | | | | |

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|---|--|---|---|-----------------------------------|---------------------|
| Numbering code | | | | | |
| Course title <English> | 先進構造材料特論 Advanced Structural Metallic Materials | Affiliated department, Job title, Name | Graduate School of Engineering Professor, TSUJI NOBUHIRO Graduate School of Engineering Associate Professor, SHIBATA AKINOBU | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/First semester |
| Day/period | Thu.2 | Class style | Lecture | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| Structural metallic materials, in particular steels, achieve their various mechanical properties based on microstructural control in micro and nano scales. This lecture treats mainly steels, and explains the mechanism of microstructure formation by solid state reactions (phase transformation / precipitation / recrystallization), and relationship between microstructure and mechanical properties. Moreover, the lecture introduces the new metallurgy for developing microstructural control methodology. | | | | | |
| [Course Goals] | | | | | |
| Understanding the microstructure formation mechanism by phase transformation / precipitation / recrystallization, and acquiring the knowledge for improvement of mechanical properties through microstructural control in micro and nano scales. | | | | | |
| [Course Schedule and Contents] | | | | | |
| Introduction, 1time, Overview of the lecture Formation mechanism of microstructure, 8times, 1. Iron and Steel, 2. Phase diagram of steel, 3. Diffusional phase transformation, 4. Diffusionless phase transformation (martensitic transformation), 5. Precipitation, 6. Recrystallization Microstructural control methodology, 5times, 1. Relationship between microstructure and mechanical properties, 2. Thermomechanical processing, 3. New metallurgy for microstructural control , 1time, | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| Evaluations are made based on attendance and report | | | | | |
| [Textbook] | | | | | |
| Materials will be distributed. | | | | | |
| [Reference books, etc.] | | | | | |
| (Reference books) Introduced during class | | | | | |
| [Regarding studies out of class (preparation and review)] | | | | | |
| The review of materials that are distributed during the class is strongly recommended. | | | | | |
| (Others (office hour, etc.)) | | | | | |
| *Please visit KULASIS to find out about office hours. | | | | | |

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|---|---|---|---|-----------------------------------|---------------------|
| Numbering code | | | | | |
| Course title <English> | 材料電気化学特論 Electrochemistry for Materials Processing, Adv. | Affiliated department, Job title, Name | Graduate School of Engineering Professor, MURASE KUNIAKI Graduate School of Engineering Associate Professor, FUKAMI KAZUHIRO | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/First semester |
| Day/period | Wed.2 | Class style | Lecture | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| | | | | | |
| [Course Goals] | | | | | |
| | | | | | |
| [Course Schedule and Contents] | | | | | |
| Modern electroplating, 4times, Thermodynamics of electrodeposition, 2times, Corrosion engineering and anodization, 4times, Semiconductor electrochemistry, 2times, Advanced materials electrochemistry, 2times, Self-assessment of achievement, 1time, | | | | | |
| [Class requirement] | | | | | |
| Knowledge of fundamental electrochemistry and chemical thermodynamics are required. | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
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| [Textbook] | | | | | |
| No textbook is required for this course. | | | | | |
| [Reference books, etc.] | | | | | |
| (Reference books) | | | | | |
| (Related URLs) | | | | | |
| (Not available) | | | | | |
| [Regarding studies out of class (preparation and review)] | | | | | |
| | | | | | |
| (Others (office hour, etc.)) | | | | | |
| Not available | | | | | |
| *Please visit KULASIS to find out about office hours. | | | | | |

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|---|---|---|---|-----------------------------------|---------------------|
| Numbering code | | | | | |
| Course title <English> | 先端マテリアルサイエンス通論 (4回コース) Introduction to Advanced Material Science and Technology (4 times course) | Affiliated department, Job title, Name | Graduate School of Engineering Senior Lecturer, YOROZU KAZUAKI Graduate School of Engineering Senior Lecturer, KANEKO KENTAROU | | |
| Target year | | Number of credits | 0.5 | Course offered year/period | 2019/First semester |
| Day/period | Fri.5 | Class style | Lecture | Language | English |
| [Outline and Purpose of the Course] | | | | | |
| 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. | | | | | |
| [Course Goals] | | | | | |
| To expand your field of vision for material science and to acquire accomplishments to identify the importance of technologies through the classes for developments in material science. | | | | | |
| [Course Schedule and Contents] | | | | | |
| <p>Topic I Organic Materials</p> <p>Week 1, Tumor imaging and therapy through photoirradiation</p> <p>Week 2, Carbon nanorings</p> <p>Week 3, Synthesis of novel pi-conjugated molecules with main group elements</p> <p>Week 4, Chemistry of asymmetric catalysis - stereoselective synthesis of optically active pharmaceutical compounds -</p> <p>Topic II Inorganic Materials</p> <p>Week 5, Properties of cementitious materials and the future</p> <p>Week 6, Application of electrical discharge to material and environmental technology</p> <p>Week 7, Theory of precision cutting, grinding, polishing and related properties of materials</p> <p>Week 8, Fabrication of inorganic nanofiber by electrospinning</p> <p>Topic III Polymeric Materials</p> <p>Week 9-10, Electrical conductivity of conjugated polymers and application to organic Electronics</p> <p>Week 11-12, An introduction to smart shape changing materials</p> | | | | | |
| [Class requirement] | | | | | |
| <p>Each topic consists of four lectures.</p> <p>This course requests to choose one topic from provided three topics in advance.</p> <p>It is prohibited to change the topic after registration.</p> <p>We may select students who can attend the class before starting the class.</p> <p>Students who intend to join the course are required to submit the application form through the web site which will be informed in the advance.</p> | | | | | |
| ----- Continue to 先端マテリアルサイエンス通論 (4回コース) (2) | | | | | |

先端マテリアルサイエンス通論(4回コース)(2)

[Method, Point of view, and Attainment levels of Evaluation]

The average score of the best two assignments is employed.
For the topic which the students chose, they must attend minimum three lectures and submit minimum two assignments evaluated as "passed".

[Textbook]

Course materials will be provided.

[Reference books, etc.]

(Reference books)

(Related URLs)

<http://www.glc.t.kyoto-u.ac.jp/grad>(The home page of the engineering education research center)

[Regarding studies out of class (preparation and review)]

This course requests students to prepare a class in advance because some classes will be done by an interactive style as necessary.

(Others (office hour, etc.))

It is prohibited to change the registered course.
It is prohibited to attend the lectures of the other topics than the students chose.
All the students are requested to attend the guidance which will be held on the first class.

*Please visit KULASIS to find out about office hours.

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|---|---|---|---|-----------------------------------|---------------------|
| Numbering code | | | | | |
| Course title <English> | 先端マテリアルサイエンス通論 (8回コース) Introduction to Advanced Material Science and Technology (8 times course) | Affiliated department, Job title, Name | Graduate School of Engineering Senior Lecturer, YOROZU KAZUAKI Graduate School of Engineering Senior Lecturer, KANEKO KENTAROU | | |
| Target year | | Number of credits | 1 | Course offered year/period | 2019/First semester |
| Day/period | Fri.5 | Class style | Lecture | Language | English |
| [Outline and Purpose of the Course] | | | | | |
| <p>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.</p> | | | | | |
| [Course Goals] | | | | | |
| <p>To expand your field of vision for material science and to acquire accomplishments to identify the importance of technologies through the classes for developments in material science.</p> | | | | | |
| [Course Schedule and Contents] | | | | | |
| <p>Topic I Organic Materials Week 1, Tumor imaging and therapy through photoirradiation Week 2, Carbon nanorings Week 3, Synthesis of novel pi-conjugated molecules with main group elements Week 4, Chemistry of asymmetric catalysis - stereoselective synthesis of optically active pharmaceutical compounds - Topic II Inorganic Materials Week 5, Properties of cementitious materials and the future Week 6, Application of electrical discharge to material and environmental technology Week 7, Theory of precision cutting, grinding, polishing and related properties of materials Week 8, Fabrication of inorganic nanofiber by electrospinning Topic III Polymeric Materials Week 9-10, Electrical conductivity of conjugated polymers and application to organic Electronics Week 11-12, An introduction to smart shape changing materials</p> | | | | | |
| [Class requirement] | | | | | |
| <p>Each topic consists of four lectures. This course requests to choose two topics from provided three topics in advance. It is prohibited to change the topics after registration. We may select students who can attend the class before starting the class. Students who intend to join the course are required to submit the application form through the web site which will be informed in the advance.</p> | | | | | |
| <p>----- Continue to 先端マテリアルサイエンス通論 (8回コース) (2)</p> | | | | | |

先端マテリアルサイエンス通論 (8回コース) (2)

[Method, Point of view, and Attainment levels of Evaluation]

The average score of the best two assignments for each topic is employed.
For each topic which the students chose, they must attend minimum three lectures and submit minimum two assignments evaluated as "passed".

[Textbook]

Not used

[Reference books, etc.]

(Reference books)

(Related URLs)

<http://www.glc.t.kyoto-u.ac.jp/grad>(The home page of the engineering education research center)

[Regarding studies out of class (preparation and review)]

This course requests students to prepare a class in advance because some classes will be done by an interactive style as necessary.

(Others (office hour, etc.))

It is prohibited to change the registered course.
It is prohibited to attend the lectures of the other topic than the students chose.
All the students are requested to attend the guidance which will be held on the first class.

*Please visit KULASIS to find out about office hours.

| | | | | | |
|---|---|---|---|-----------------------------------|---------------------|
| Numbering code | | | | | |
| Course title <English> | 先端マテリアルサイエンス通論 (12回コース) Introduction to Advanced Material Science and Technology (12 times course) | Affiliated department, Job title, Name | Graduate School of Engineering Senior Lecturer, YOROZU KAZUAKI Graduate School of Engineering Senior Lecturer, KANEKO KENTAROU | | |
| Target year | | Number of credits | 1.5 | Course offered year/period | 2019/First semester |
| Day/period | Fri.5 | Class style | Lecture | Language | English |
| [Outline and Purpose of the Course] | | | | | |
| 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. | | | | | |
| [Course Goals] | | | | | |
| To expand your field of vision for material science and to acquire accomplishments to identify the importance of technologies through the classes for developments in material science. | | | | | |
| [Course Schedule and Contents] | | | | | |
| <p>Topic I Organic Materials</p> <p>Week 1, Tumor imaging and therapy through photoirradiation</p> <p>Week 2, Carbon nanorings</p> <p>Week 3, Synthesis of novel pi-conjugated molecules with main group elements</p> <p>Week 4, Chemistry of asymmetric catalysis - stereoselective synthesis of optically active pharmaceutical compounds -</p> <p>Topic II Inorganic Materials</p> <p>Week 5, Properties of cementitious materials and the future</p> <p>Week 6, Application of electrical discharge to material and environmental technology</p> <p>Week 7, Theory of precision cutting, grinding, polishing and related properties of materials</p> <p>Week 8, Fabrication of inorganic nanofiber by electrospinning</p> <p>Topic III Polymeric Materials</p> <p>Week 9-10, Electrical conductivity of conjugated polymers and application to organic Electronics</p> <p>Week 11-12, An introduction to smart shape changing materials</p> | | | | | |
| [Class requirement] | | | | | |
| <p>Each topic consists of four lectures.</p> <p>This course requests to take all provided three topics.</p> <p>We may select students who can attend the class before starting the class.</p> <p>Students who intend to join the course are required to submit the application form through the web site which will be informed in the advance.</p> | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| <p>The average score of the best two assignments for each topics is employed.</p> <p>For each topic, the students must attend minimum three lectures and submit minimum two assignments</p> | | | | | |
| ----- Continue to 先端マテリアルサイエンス通論 (12回コース) (2) ----- | | | | | |

先端マテリアルサイエンス通論 (12回コース) (2)

evaluated as "passed".

[Textbook]

Not used

[Reference books, etc.]

(Reference books)

(Related URLs)

<http://www.glc.t.kyoto-u.ac.jp/grad>(The home page of the engineering education research center)

[Regarding studies out of class (preparation and review)]

This course requests students to prepare a class in advance because some classes will be done by an interactive style as necessary.

(Others (office hour, etc.))

It is prohibited to change the registered course.

*Please visit KULASIS to find out about office hours.

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|--|--|--|--|-----------------------------------|---------------------|
| Numbering code | | | | | |
| Course title <English> | 社会基盤材料特論 Advanced Materials Science & Engineering in industries I | Affiliated department, Job title,Name | Graduate School of Engineering Professor,TSUJI NOBUHIRO | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/First semester |
| Day/period | Tue.4 | Class style | Lecture | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| | | | | | |
| [Course Goals] | | | | | |
| | | | | | |
| [Course Schedule and Contents] | | | | | |
| ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| | | | | | |
| Continue to 社会基盤材料特論 (2) | | | | | |

社会基盤材料特論 (2)

[Textbook]

[Reference books, etc.]

(Reference books)

[Regarding studies out of class (preparation and review)]

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

| | | | | | |
|---|---|--|--|---------------------------------------|----------------------|
| Numbering code | | | | | |
| Course title <English> | 社会基盤材料特論 Advanced Materials Science & Engineering in industries II | Affiliated department, Job title,Name | Graduate School of Engineering Professor,TSUJI NOBUHIRO | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/Second semester |
| Day/period | Tue.4 | Class style | Lecture | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| | | | | | |
| [Course Goals] | | | | | |
| | | | | | |
| [Course Schedule and Contents] | | | | | |
| ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, ,1time, | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| | | | | | |
| Continue to 社会基盤材料特論 (2) | | | | | |

社会基盤材料特論 (2)

[Textbook]

[Reference books, etc.]

(Reference books)

[Regarding studies out of class (preparation and review)]

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

| | | | | | |
|---|---|---|---|-----------------------------------|----------------------------|
| Numbering code | | | | | |
| Course title <English> | インターンシップM (材料工学) Internship in Materials Science & Engineering | Affiliated department, Job title, Name | Graduate School of Engineering Professor, TSUJI NOBUHIRO | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/Intensive, year-round |
| Day/period | Intensive | Class style | Practical training | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| | | | | | |
| [Course Goals] | | | | | |
| | | | | | |
| [Course Schedule and Contents] | | | | | |
| ,1time, ,13times, ,1time, | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| | | | | | |
| [Textbook] | | | | | |
| | | | | | |
| [Reference books, etc.] | | | | | |
| (Reference books) | | | | | |
| [Regarding studies out of class (preparation and review)] | | | | | |
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| (Others (office hour, etc.)) | | | | | |
| *Please visit KULASIS to find out about office hours. | | | | | |

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|---|--|---|--|-----------------------------------|--------------------------------|
| Numbering code | | | | | |
| Course title <English> | 材料工学セミナー A Seminar on Materials Science and Engineering A | Affiliated department, Job title, Name | Graduate School of Engineering Professor, INUI HARUYUKI | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/Intensive, First semester |
| Day/period | Intensive | Class style | Seminar | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| | | | | | |
| [Course Goals] | | | | | |
| | | | | | |
| [Course Schedule and Contents] | | | | | |
| ,1time, ,1time, ,12times, ,1time, | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| | | | | | |
| [Textbook] | | | | | |
| | | | | | |
| [Reference books, etc.] | | | | | |
| (Reference books) | | | | | |
| [Regarding studies out of class (preparation and review)] | | | | | |
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| (Others (office hour, etc.)) | | | | | |
| *Please visit KULASIS to find out about office hours. | | | | | |

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|---|--|--|--|-----------------------------------|---------------------------------|
| Numbering code | | | | | |
| Course title <English> | 材料工学セミナー B Seminar on Materials Science and Engineering B | Affiliated department, Job title,Name | Graduate School of Engineering Professor, INUI HARUYUKI | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/Intensive, Second semester |
| Day/period | Intensive | Class style | Seminar | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| | | | | | |
| [Course Goals] | | | | | |
| | | | | | |
| [Course Schedule and Contents] | | | | | |
| ,1time, ,1time, ,12times, ,1time, | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| | | | | | |
| [Textbook] | | | | | |
| | | | | | |
| [Reference books, etc.] | | | | | |
| (Reference books) | | | | | |
| [Regarding studies out of class (preparation and review)] | | | | | |
| | | | | | |
| (Others (office hour, etc.)) | | | | | |
| *Please visit KULASIS to find out about office hours. | | | | | |

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|---|--|---|--|-----------------------------------|----------------------------|
| Numbering code | | | | | |
| Course title <English> | 材料工学特別実験及演習第一 Laboratory & Seminar in Materials Science and Engineering, Adv. I | Affiliated department, Job title, Name | Graduate School of Engineering Professor, INUI HARUYUKI | | |
| Target year | | Number of credits | 4 | Course offered year/period | 2019/Intensive, year-round |
| Day/period | Intensive | Class style | Experiment | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
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| [Course Goals] | | | | | |
| | | | | | |
| [Course Schedule and Contents] | | | | | |
| ,5times, ,5times, ,10times, | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| | | | | | |
| [Textbook] | | | | | |
| | | | | | |
| [Reference books, etc.] | | | | | |
| (Reference books) | | | | | |
| [Regarding studies out of class (preparation and review)] | | | | | |
| | | | | | |
| (Others (office hour, etc.)) | | | | | |
| *Please visit KULASIS to find out about office hours. | | | | | |

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|---|---|---|--|-----------------------------------|----------------------------|
| Numbering code | | | | | |
| Course title <English> | 材料工学特別実験及演習第二 Laboratory & Seminar in Materials Science and Engineering, Adv. II | Affiliated department, Job title, Name | Graduate School of Engineering Professor, INUI HARUYUKI | | |
| Target year | | Number of credits | 4 | Course offered year/period | 2019/Intensive, year-round |
| Day/period | Intensive | Class style | Experiment | Language | Japanese |
| [Outline and Purpose of the Course] | | | | | |
| | | | | | |
| [Course Goals] | | | | | |
| | | | | | |
| [Course Schedule and Contents] | | | | | |
| ,5times, ,5times, ,10times, | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| | | | | | |
| [Textbook] | | | | | |
| | | | | | |
| [Reference books, etc.] | | | | | |
| (Reference books) | | | | | |
| [Regarding studies out of class (preparation and review)] | | | | | |
| | | | | | |
| (Others (office hour, etc.)) | | | | | |
| *Please visit KULASIS to find out about office hours. | | | | | |

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|--|--|---|---|-----------------------------------|----------------------------|
| Numbering code | | | | | |
| Course title <English> | 工学研究科国際インターンシップ 1 International Internship in Engineering 1 | Affiliated department, Job title, Name | Graduate School of Engineering Senior Lecturer, NISHIKAWA MIKAKO | | |
| Target year | | Number of credits | 1 | Course offered year/period | 2019/Intensive, year-round |
| Day/period | Intensive | Class style | Practical training | Language | English |
| [Outline and Purpose of the Course] | | | | | |
| 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. | | | | | |
| [Course Goals] | | | | | |
| Acquisition of international skills with the training of foreign language. | | | | | |
| [Course Schedule and Contents] | | | | | |
| Overseas Internship, 1 times, The contents to be acquired should be described in the brochure of each internship program. Final Presentation, 1 times, A presentation by the student is required followed by discussion among participants. | | | | | |
| [Class requirement] | | | | | |
| Described in the application booklet for each internship program. The registrant is requested to have enough language skills for the participation. | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| 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. | | | | | |
| [Textbook] | | | | | |
| Not Applicable | | | | | |
| [Reference books, etc.] | | | | | |
| (Reference books) Not Applicable | | | | | |
| Continue to 工学研究科国際インターンシップ1(2) | | | | | |

工学研究科国際インターンシップ 1 (2)

(Related URLs)

(Not Applicable)

[Regarding studies out of class (preparation and review)]

Not Applicable

(Others (office hour, etc.))

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 is enrolled. If the credit could not be treated as mandatory ones, get in touch with the Global Leadership Engineering Education Center.

*Please visit KULASIS to find out about office hours.

| | | | | | |
|--|--|--------------------------|---|---|----------------------------|
| Numbering code | | | | | |
| Course title <English> | 工学研究科国際インターンシップ 2 International Internship in Engineering 2 | | Affiliated department, Job title, Name | Graduate School of Engineering Senior Lecturer, NISHIKAWA MIKAKO | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/Intensive, year-round |
| Day/period | Intensive | Class style | Practical training | Language | English |
| [Outline and Purpose of the Course] | | | | | |
| 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. | | | | | |
| [Course Goals] | | | | | |
| Acquisition of international skills with the training of foreign language. Detailed objectives should be described in each program. | | | | | |
| [Course Schedule and Contents] | | | | | |
| Overseas Internship, 1 times, The contents to be acquired should be described in the brochure of each internship program. Final Presentation, 1 times, A presentation by the student is required followed by discussion among participants. | | | | | |
| [Class requirement] | | | | | |
| Described in the application booklet for each internship program. The registrant is requested to have enough language skills for the participation. | | | | | |
| [Method, Point of view, and Attainment levels of Evaluation] | | | | | |
| 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. | | | | | |
| [Textbook] | | | | | |
| Not Applicable. | | | | | |
| Continue to 工学研究科国際インターンシップ 2(2) | | | | | |

工学研究科国際インターンシップ2 (2)

[Reference books, etc.]

(Reference books)

Not Applicable.

(Related URLs)

(Not Applicable.)

[Regarding studies out of class (preparation and review)]

Not Applicable.

(Others (office hour, etc.))

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 is enrolled. If the credit could not be treated as mandatory ones, get in touch with the Global Leadership Engineering Education Center.

*Please visit KULASIS to find out about office hours.

| | | | | | |
|--|---|--|---|---------------------------------------|---------------------|
| Numbering code | | | | | |
| Course title <English> | エンジニアリングプロジェクトマネジメント Project Management in Engineering | Affiliated department, Job title,Name | Graduate School of Engineering Senior Lecturer,MATSUMOTO RIYOSUKE Graduate School of Engineering Senior Lecturer,ASHIDA RIYUICHI Graduate School of Engineering Senior Lecturer,MAEDA MASAHIRO Graduate School of Engineering Senior Lecturer,YOROZU KAZUAKI Graduate School of Engineering Senior Lecturer,KANEKO KENTAROU Graduate School of Engineering Associate Professor,Juha Lintuluoto | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/First semester |
| Day/period | Fri.4 | Class style | Lecture | Language | English |
| [Outline and Purpose of the Course] | | | | | |
| 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 project. Some lectures are provided by visiting lecturers from industry and public works who have many experiences on actual engineering projects. | | | | | |
| [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 Exercise on Project Management in Engineering in the second semester. | | | | | |
| [Course Schedule and Contents] | | | | | |
| Week 1, Course guidance Week 2-3, Introduction to project management Week 4, Project scheduling Week 5-7, Tools for project management, cost, and cash flows Week 8-9, Team organization and administration Week 10, Negotiation skills/tactics/examples in business marketing Week 11, Environmental impact assessment Week 12-13, Risk management Week 14, Project management for engineering procurement construction business Week 15, Feedback | | | | | |
| [Class requirement] | | | | | |
| We may restrict the class size to enhance students' learning. Students who intend to join the course are required to attend the first class. | | | | | |
| ----- Continue to エンジニアリングプロジェクトマネジメント(2) | | | | | |

エンジニアリングプロジェクトマネジメント(2)

[Method, Point of view, and Attainment levels of Evaluation]

Evaluated by class contribution (or level of understanding) at each class (60%) and assignments (40%)

[Textbook]

Course materials will be provided.

[Reference books, etc.]

(Reference books)

Lock, Dennis 『Project Management, 10th edition』 (Gower Publishing Ltd.) ISBN:1409452697

Cleland, David L., and Ireland, Lewis R. 『Project Management: Strategic Design and Implementation, 5th edition』 (McGraw-Hill Professional) ISBN:007147160X

Miller, Roger and Lessard, Donald R. 『The strategic management of large engineering projects, Shaping Institutions, Risks, and Governance』 (The MIT Press) ISBN:9780262526982

(Related URLs)

<http://www.glc.t.kyoto-u.ac.jp/grad>(The home page of the engineering education research center)

[Regarding studies out of class (preparation and review)]

This course requests students to prepare a class in advance because some classes will be done by an interactive style as necessary.

(Others (office hour, etc.))

We may restrict the class size to enhance students' learning.

Students who intend to join the course are required to attend the first class.

*Please visit KULASIS to find out about office hours.

| | | | | | |
|---|---|--|--|---------------------------------------|----------------------|
| Numbering code | | | | | |
| Course title <English> | エンジニアリングプロジェクトマネジメント演習 Exercise on Project Management in Engineering | Affiliated department, Job title,Name | Graduate School of Engineering Senior Lecturer,MATSUMOTO RIYOSUKE Graduate School of Engineering Senior Lecturer,ASHIDA RIYUUICHI Graduate School of Engineering Senior Lecturer,MAEDA MASAHIRO Graduate School of Engineering Senior Lecturer,YOROZU KAZUAKI Graduate School of Engineering Senior Lecturer,KANEKO KENTAROU Graduate School of Engineering Associate Professor,Juha Lintuluoto | | |
| Target year | | Number of credits | 2 | Course offered year/period | 2019/Second semester |
| Day/period | Fri.4,5 | Class style | Seminar | Language | English |
| [Outline and Purpose of the Course] | | | | | |
| <p>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 final report will be required.</p> | | | | | |
| [Course Goals] | | | | | |
| <p>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.</p> | | | | | |
| [Course Schedule and Contents] | | | | | |
| <p>Week 1, Introduction to Exercise on Project Management in Engineering, Lecture on tools for the Project management in engineering, Practice and Project proposal. Week 2, Group finalizations & Project selections. Week 3-7, Group work, Project preliminary structures, Task list, WBS, Cost, Gant chart. Week 8, Mid-term presentation. Week 9-11, Group work, Leadership structuring, Risk Management, Environmental Impact Assessment. Week 12, Presentation. Each project group may freely schedule the group works within given time frame. The course instructors are available if any need is required. Some lectures will be provided such as Task list, WBS, Cost, Gant chart, Leadership structuring, Risk Management, Environmental Impact Assessment, and more.</p> | | | | | |
| Continue to エンジニアリングプロジェクトマネジメント演習(2) | | | | | |

エンジニアリングプロジェクトマネジメント演習(2)

[Class requirement]

Fundamental skills about group leading and communication, scientific presentation.
We may restrict the class size to enhance students' learning.
Students who intend to join the course are required to attend the first class.

[Method, Point of view, and Attainment levels of Evaluation]

Report, presentations, class activity (at least 10 times attendance including mid-term and final presentations).

[Textbook]

Course materials will be provided if necessary.

[Reference books, etc.]

(Reference books)

Will be informed if necessary.

(Related URLs)

<http://www.glc.t.kyoto-u.ac.jp/grad>(The home page of the engineering education research center)

[Regarding studies out of class (preparation and review)]

Students are requested to prepare for group work, mid-term presentation and final presentation.

(Others (office hour, etc.))

We may restrict the class size to enhance students' learning.
Students who intend to join the course are required to attend the first class.

*Please visit KULASIS to find out about office hours.

| | | | | | |
|--|---|-------------------------|--|--|--|
| Numbering code | | G-LAS00 80001 LJ20 | | | |
| Course title <English> | 研究倫理・研究公正（理工系） Research Ethics and Integrity(Science and Technology) | | Affiliated department, Job title,Name | Institute for Liberal Arts and Sciences Program-Specific Professor,ITO SHINZABUROU Institute for Liberal Arts and Sciences Program-Specific Professor,SATOU TOORU Graduate School of Engineering Professor,KAWAKAMI YOUICHI | |
| | Group | Common Graduate Courses | | Field(Classification) | Social Responsibility and Profitability |
| Language | Japanese | | Old group | | Number of credits 0.5 |
| Hours | 7.5 | Class style | Lecture | | Course offered year/period 2019・Intensive, First semester |
| Day/period | Intensive | Target year | Graduate students | Eligible students | For science students |
| [Outline and Purpose of the Course] | | | | | |
| <p>研究をこれから始める大学院生に責任ある行動をする研究者として身につけておくべき心構えを講述する。研究者としての規範を保っていかん研究を進めるか、また研究成果の適切な発表方法など、研究倫理・研究公正についてさまざまな例を示しながら、科学研究における不正行為がいかに健全な科学の発展の妨げになるか、またデータの正しい取扱いや誠実な研究態度、発表の仕方が、自らの立場を守るためにもいかに重要かを講義する。さらに、研究費の適切な使用と知的財産や利益相反について学ぶ。講義に続いてグループワークを行い、与えられた仮想課題を自らの問題として考え、解決方法のディスカッションを行う。</p> | | | | | |
| [Course Goals] | | | | | |
| <p>第1講～第4講を通じて、研究者としての責任ある行動とは何かを修得する。科学研究における不正行為の事例学習、討論を通じて、誠実な研究活動を遂行する研究者の心得を身につけ、最後に研究倫理・研究公正についてのe-ラーニングコースを受講し、理解度を確認する。</p> | | | | | |
| [Course Schedule and Contents] | | | | | |
| <p>第1講 科学研究における心構え - 研究者の責任ある行動とは -</p> <ol style="list-style-type: none"> 1. 研究者の責任ある行動とは（学術活動に参加する者としての義務） 2. 不正の可能性と対応 3. 実験室の安全対策と環境への配慮 4. データの収集と管理 - 実験データの正しい取扱い方 - 5. 科学上の間違いと手抜き行為の戒め 6. 誠実な研究活動中の間違いとの区別 7. 科学研究における不正行為 <p>第2講 研究成果を発表する際の研究倫理公正</p> <ol style="list-style-type: none"> 1. 研究成果の共有 2. 論文発表の方法とプロセス 3. 科学研究における不正行為（典型的な不正） 4. データの取扱い（データの保存・公開・機密） 5. その他の逸脱行為（好ましくない研究行為） 6. 研究不正事件（シェーン捏造事件） 7. 不適切な発表方法（オーサーシップ、二重投稿） <p>第3講 知的財産と研究費の適正使用</p> <ol style="list-style-type: none"> 1. 知的財産の考え方（知的財産の確保と研究発表） 2. 研究資金と契約 | | | | | |
| Continue to 研究倫理・研究公正（理工系）(2) | | | | | |

研究倫理・研究公正（理工系）(2)

3. 利益相反（利害の衝突と回避）
4. 公的研究費の適切な取扱い
5. 研究者・研究機関へのペナルティー
6. 事例紹介（ビデオ：分野共通4件）
7. 結語

第4講 グループワーク

1. 例示された課題についてグループ・ディスカッションと発表
2. 日本学術振興会「研究倫理ラーニングコース」の受講と修了証書の提出

[Class requirement]

None

[Method, Point of view, and Attainment levels of Evaluation]

第1～4講の全てに出席と参加の状況、ならびに学術振興会e-learningの修了証の提出をもって合格を判定する。

[Textbook]

日本学術振興会「科学の健全な発展のために」編集委員会『科学の健全な発展のために - 誠実な科学者の心得 -』（丸善出版）ISBN:978-4621089149（学術振興会のHP（<https://www.jsps.go.jp/j-kousei/data/rinri.pdf>）より、テキスト版をダウンロード可能）

[Reference book, etc.]

（Reference book）

米国科学アカデミー 編、池内 了 訳 『科学者をめざす君たちへ 研究者の責任ある行動とは』（化学同人）ISBN:978-4759814286
眞嶋俊造、奥田太郎、河野哲也 編著 『人文・社会科学のための研究倫理ガイドブック』（慶応義塾大学出版会）ISBN:978-4766422559
神里彩子、武藤香織 編 『医学・生命科学の研究倫理ハンドブック』（東京大学出版会）ISBN:978-4130624138
野島高彦 著 『誰も教えてくれなかった実験ノートの書き方』（化学同人）ISBN:978-4759819335
須田桃子 著 『捏造の科学者 STAP細胞事件』（文藝春秋）ISBN:978-4163901916

[Regarding studies out of class (preparation and review)]

日本学術振興会「研究倫理ラーニングコース」の受講

[Others (office hour, etc.)]

第1～3講は土曜2, 3, 4限に行う。第4講はグループワークを中心として講義の翌週または翌々週の土曜1, 2または3, 4限に実施する。

| | | | | | |
|---|--|-------------------------|---|---|--|
| Numbering code | | G-LAS01 80001 LJ10 | | | |
| Course title <English> | 学術研究のための情報リテラシー基礎 Basics of Academic Information Literacy | | Affiliated department, Job title, Name | Institute for Liberal Arts and Sciences Professor, KITA HAJIME Kyoto University Library Associate Professor, KITAMURA YUMI Academic Center for Computing and Media Studies Program-Specific Senior Lecturer, FLANAGAN, Brendan John Academic Center for Computing and Media Studies Professor, Ogata Hiroaki | |
| | Group | Common Graduate Courses | | Field(Classification) | Computer Science and Information Technology |
| Language | Japanese | | Old group | | Number of credits 0.5 |
| Hours | 7.5 | Class style | Lecture | | Course offered year/period 2019・Intensive, First semester |
| Day/period | Intensive | | Target year | Graduate students | Eligible students For all majors |
| [Outline and Purpose of the Course] | | | | | |
| <p>本科目では大学院生として研究室などでの研究活動を本格化させるための基礎的な知識・スキルとして、大学図書館などを活用した学術情報の探索と発信、本学が提供する情報通信サービスの理解とその適正な運用、その基礎となる情報ネットワークやコンピュータについての実践的事項、情報セキュリティと情報倫理などを学習する。</p> | | | | | |
| [Course Goals] | | | | | |
| <p>大学図書館などを利用した学術目的の情報探索、情報発信について、効果的な文献の探索・収集・活用の手法と、論文として発表する際のマナーを知る。</p> <p>研究活動でコンピュータやLAN、インターネットを適切に利用するための技術的な基礎知識を知る。</p> <p>研究室でのネットワーク利用のために本学が提供しているKUINS等の情報通信サービスについて知り、適切に利用できるようになる。</p> <p>研究活動でコンピュータやネットワークを利用する際の本学での遵守事項や情報セキュリティ・情報倫理上の留意点を知り、実践できるようになる。</p> | | | | | |
| [Course Schedule and Contents] | | | | | |
| <p>以下、4回の授業を集中講義形式で実施する。</p> <ul style="list-style-type: none"> ・学術研究のための大学図書館利用と情報探索、情報発信(1回) ・ネットワークの基礎(1回) ・大学の情報基盤の利活用(1回) ・情報セキュリティと情報倫理(1回) | | | | | |
| [Class requirement] | | | | | |
| None | | | | | |
| Continue to 学術研究のための情報リテラシー基礎(2) | | | | | |

学術研究のための情報リテラシー基礎(2)

[Method, Point of view, and Attainment levels of Evaluation]

授業への参加（課題の提出）により評価する。情報環境機構が提供する情報セキュリティ e-learning の修了は合格の要件である。

[Textbook]

プリント等を電子的に配布する。

[Regarding studies out of class (preparation and review)]

情報セキュリティ e-learning についてはあらかじめ修了しておくこと。授業外学習として課題を課す。

[Others (office hour, etc.)]

受講時に、受講前に持っている情報リテラシーについての知識・スキル等を調査する予定である。授業資料は電子的に配布するので、ノートPCなどを持参して受講することが望ましい。

| | | | | |
|---|--|--|---|--|
| Numbering code | | G-INF01 53154 LJ10 G-INF01 53154 LJ12 G-INF01 53154 LJ11 | | |
| Course title <English> | 情報科学基礎論 Introduction to Information Science | | Affiliated department, Job title, Name | Graduate School of Informatics Professor, YAMAMOTO AKIHIRO Graduate School of Informatics Professor, KASHIMA HISASHI Graduate School of Informatics Professor, NISHIDA TOYOAKI Graduate School of Informatics Professor, KUROHASHI SADA O Graduate School of Informatics Professor, KAWAHARA TATSUYA Graduate School of Informatics Professor, NISHINO KO Academic Center for Computing and Media Studies Professor, OKABE YASUO Academic Center for Computing and Media Studies Professor, MORI SHINSUKE |
| Target year | 1st year students or above | Number of credits | 2 | Course offered year/period 2019/First semester |
| Day/period | Tue.4 | Class style | Lecture | Language Japanese |
| Class type | 専攻基礎科目 | | | |
| [Outline and Purpose of the Course] | | | | |
| 高度情報化社会である今日，至るところに蓄積される大量のデータを解析するための科学であるデータ科学は，学術全般・産業界のみならず日常生活の至る所に大きな変化をもたらそうとしているデータ科学の根幹である情報学・統計学・数理科学に対する基本的な理解，特に情報科学に関する基礎的知識は社会を支える広範な人材にとっての基礎的な教養である．本講義は，情報系・電気電子系学科以外の出身者が，情報科学に関する基礎的内容を修得することを目的とする． | | | | |
| [Course Goals] | | | | |
| 情報系・電気電子系学科以外の出身者が，大学院での学修の基礎として，あるいは現代社会を支える人材として求められる素養としての情報科学に関する基礎的知識を修得する． | | | | |
| [Course Schedule and Contents] | | | | |
| 1. 計算機工学: ビット列によるデータ表現, 論理演算子と電子回路による実現, 組み合わせ論理回路と順序回路, 基本演算回路, 計算機アーキテクチャ 2. アルゴリズムとデータ構造: さまざまなデータ構造と探索アルゴリズム 3. 形式言語理論とオートマトン: 言語の形式的定義と形式文法, 正規文法と有限オートマトン, 文脈自由文法 4. パターン認識: パターン情報処理, ベイズ決定, 識別関数 5. 情報理論: 情報メディアの構造, シャノンの情報理論, 情報の表現・デジタル化・符号化 6. コンピュータネットワーク: インターネットとは, ネットワークの階層モデル, IP と経路制御プロトコル, TCP における輻輳制御 7. 推論とプログラム: 推論の形式化, プログラムの理論 8. 人工知能基礎: 人工知能研究の歴史と発見的探索, 機械学習とデータマイニング入門 当該年度の授業回数などに応じて一部省略, 追加がありうる． | | | | |
| | | | | Continue to 情報科学基礎論(2) |

情報科学基礎論(2)

[Class requirement]

本講義は、情報系・電気電子系学科以外の出身者を対象とした学部専門科目の概要紹介であるのでこれらの学科の出身者は、本講義の単位を修得することはできない。もちろん、本講義の全部あるいは一部を聴講することは可能である。

[Method, Point of view, and Attainment levels of Evaluation]

各単元において出題するレポートにより情報学研究科成績評価規定第7条により評価する。試験を行うこともある。情報系・電気電子系学科の学部の講義内容を修得することを目標とする。

[Textbook]

Not used

[Reference books, etc.]

(Reference books)

[Regarding studies out of class (preparation and review)]

各単元において出題されるレポート課題に取り組むとともに、講義内容やそれに関連する内容について各自予習復習を行うこと。

(Others (office hour, etc.))

*Please visit KULASIS to find out about office hours.

| | | | | | |
|--|---|--|--|---------------------------------------|---------------------------------------|
| Numbering code | G-LAS02 80001 SE48 | | | | |
| Course title <English> | 大学院生のための英語プレゼンテーション Presentation for Graduate Students | Affiliated department, Job title,Name | Institute for Liberal Arts and Sciences Senior Lecturer,RYLANDER , John William | | |
| Group | Common Graduate Courses | Field(Classification) | Language and Communication | | |
| Language | English | Old group | | Number of credits | 1 |
| Hours | 15 | Class style | Seminar | Course offered year/period | 2019・ Intensive, First semester |
| Day/period | Intensive | Target year | Graduate students | Eligible students | For all majors |
| [Outline and Purpose of the Course] | | | | | |
| This course is designed to provide graduate students with an opportunity to develop their ability and confidence when presenting field-specific content to an informed audience. Giving presentations in an academic setting, whether it is in a classroom, laboratory context, or at a conference, has become increasingly necessary for students at the graduate level. Course content extends from how to greet the audience to how to answer audience questions. | | | | | |
| [Course Goals] | | | | | |
| Students successfully completing this course will be able to do the following: | | | | | |
| <ul style="list-style-type: none"> • Create an appropriate presentation slideshow for a conference or a research laboratory presentation; • Clearly introduce and provide an overview of the talk through appropriate signposting; • Properly display visual aids to enhance audience understanding of research data; • Use posture and movement to engage the audience; • Use gestures and gaze to emphasize information and connect with the audience; • Produce a presentation; and • Answer audience questions. | | | | | |
| [Course Schedule and Contents] | | | | | |
| Session 1: Purpose and structure of academic presentations Session 2: Topic selection and development Session 3: Information organization: From greetings to goodbyes Session 4: Creating effective slideshows and displaying research data Session 5: Body language and gestures Session 6: Answering audience questions Session 7: A special focus on data significance Session 8: Student presentations and instructor feedback | | | | | |
| [Class requirement] | | | | | |
| This course has a limit set on student enrollment. In the case where many students wish to enroll in class, a lottery system will decide inclusion. | | | | | |
| ----- Continue to 大学院生のための英語プレゼンテーション(2) | | | | | |

大学院生のための英語プレゼンテーション(2)

[Method, Point of view, and Attainment levels of Evaluation]

30% Active Participation
30% Slideshow Creation
40% Main and Minor Presentations

[Textbook]

Not used

[Reference book, etc.]

(Reference book)

All course materials will be provided to the students by the teacher.

[Regarding studies out of class (preparation and review)]

Students will be asked to work on several smaller in-class talks and one larger presentation as their primary out-of-class homework assignment.

[Others (office hour, etc.)]