| 科目コード (Code) | 科目名 (Course title) | Course title (English) |
|---|---|---|
| 10H001 | 無機材料化学 | Chemistry of Inorganic Materials |
| 10H004 | 有機材料化学 | Chemistry of Organic Materials |
| 10H007 | 高分子材料化学 | Chemistry of Polymer Materials |
| 10H010 | 機能材料化学 | Chemistry of Functional Materials |
| 10H013 | 無機構造化学 | Chemistry and Structure of Inorganic Compounds |
| 10H015 | 応用固体化学 | Industrial Solid-State Chemistry |
| 10H019 | 有機材料合成化学 | Synthesis of Organic Materials |
| 10H022 | 有機天然物化学 | Chemistry of Organic Natural Products |
| 10H025 | 材料解析化学 | Analysis and Characterization of Materials |
| 10H029 | 高分子機能物性 | Polymer Physics and Function |
| 10H031 | 生体材料化学 | Chemistry of Biomaterials |
| 10H034 | 材料解析化学II | Analysis and Characterization of Materials II |
| 10D037 | 材料化学特別実験及演習 | Laboratory and Exercise in Material Chemistry |
| 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) |
| 10i055 | 現代科学技術特論（4回コース） | Advanced Modern Science and Technology(4 times course) |
| 10i056 | 現代科学技術特論（8回コース） | Advanced Modern Science and Technology(8 times course) |
| 10i060 | 現代科学技術特論（12回コース） | Advanced Modern Science and Technology(12 times course) |
| 10i045 | 実践的科学英語演習Ⅰ | Exercise in Practical Scientific English I |
| 10i057 | 安全衛生工学（4回コース） | Safety and Health Engineering(4 times course) |
| 10i058 | 安全衛生工学（11回コース） | Safety and Health Engineering(11 times course) |
| 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 |
| 10H041 | 有機金属化学１ | Organotransition Metal Chemistry 1 |
| 10H042 | 有機金属化学２ | Organotransition Metal Chemistry 2 |
| 10D043 | 先端科学機器分析及び実習I | Instrumental Analysis,Adv.I |
| 10D046 | 先端科学機器分析及び実習II | Instrumental Analysis,Adv.II |
| 10P055 | 材料化学特論第一 | Material Chemistry Adv. I |
| 10P056 | 材料化学特論第二 | Material Chemistry Adv. II |
| 10P057 | 材料化学特論第三 | Material Chemistry Adv. III |
| 10P058 | 材料化学特論第四 | Material Chemistry Adv. IV |
| 10P110 | 材料化学総論 | General Material Chemistry |
| 10P111 | 化学産業特論 | Chemical Industry, Advanced |

未更新

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 無機材料化学<br>Chemistry of Inorganic Materials | Affiliated department, Job title,Name | Graduate School of Engineering<br>Professor,MIURA KIYOTAKA<br>Institute for Liberal Arts and Sciences<br>Professor,TANAKA KATSUHISA |

| Target year | | Number of credits | 1.5 | Course offered year/period | 2019/First semester |
|---|---|---|---|---|---|

| Day/period | Mon.2 | Class style | Lecture | Language | Japanese |
|---|---|---|---|---|---|

**[Outline and Purpose of the Course]**

Structure, characterization, synthesis, and properties of inorganic materials are described on the basis of solid-state chemistry of inorganic matters.

**[Course Goals]**

**[Course Schedule and Contents]**

,1time,
,4times,
,4times,
,1time,
,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.

未更新

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 有機材料化学<br>Chemistry of Organic Materials | Affiliated department, Job title,Name | Graduate School of Engineering<br>Professor,MATSUBARA SEIJIROU<br>Graduate School of Engineering<br>Professor,NAKAO YOSHIAKI<br>Graduate School of Engineering<br>Associate Professor,KURAHASHI TAKUYA |

| Target year | | Number of credits | 1.5 | Course offered year/period | 2019/First semester |
|---|---|---|---|---|---|
| Day/period | Mon.1 | Class style | Lecture | Language | Japanese |

**[Outline and Purpose of the Course]**

**[Course Goals]**

**[Course Schedule and Contents]**

,1time,
,1time,
,1time,
,3times,
,1time,
,1time,
,3times,
,2times,
,2times,

**[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.

未更新

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 高分子材料化学<br>Chemistry of Polymer Materials | Affiliated department, Job title,Name | Graduate School of Engineering<br>Professor,TAKIGAWA TOSHIKAZU<br>Graduate School of Engineering<br>Associate Professor,HORINAKA JIYUNICHI<br>Graduate School of Engineering<br>Senior Lecturer,OOMAE MASASHI |

| Target year | | Number of credits | 1.5 | 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]**

physical properties of polymers,3times,physical properties of polymers
structure and physics of high-performance polymers,3times,structure and physics of high-performance polymers
molecular design and function of functional polymers,6times,molecular design and function of functional polymers
,,

**[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.

未更新

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 機能材料化学<br>Chemistry of Functional Materials | Affiliated department, Job title,Name | Graduate School of Engineering<br>Professor,FUJITA KOUJI |

| Target year | | Number of credits | 1.5 | Course offered year/period | 2019/Second semester |
|---|---|---|---|---|---|
| Day/period | Wed.1 | Class style | Lecture | Language | Japanese |

**[Outline and Purpose of the Course]**

**[Course Goals]**

**[Course Schedule and Contents]**

,1time,
,1time,
,1time,
,2times,
,1time,
,1time,
,1time,
,1time,
,1time,
,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.

| Numbering code | G-ENG12 6H013 LJ62 | | |
|---|---|---|---|
| Course title <English> | 無機構造化学<br>Chemistry and Structure of Inorganic Compounds | Affiliated department, Job title,Name | Institute for Liberal Arts and Sciences<br>Professor,TANAKA KATSUHISA<br>Graduate School of Engineering<br>Professor,MIURA KIYOTAKA<br>Graduate School of Engineering<br>Associate Professor,SHIMOTSUMA YASUHIKO |

| Target year | | Number of credits | 1.5 | Course offered year/period | 2019/Second semester |
|---|---|---|---|---|---|

| Day/period | Fri.2 | Class style | Lecture | Language | Japanese |
|---|---|---|---|---|---|

**[Outline and Purpose of the Course]**

無機材料の非晶質状態と結晶の構造、構造に基づく物理的・化学的特性とその制御法、工業材料としての応用などについて述べる.

**[Course Goals]**

無機固体や無機材料の構造に関する知識を得て、専門的な論文を読んで内容を理解できるようになる。

**[Course Schedule and Contents]**

計算材料化学（2回）
無機固体を対象とした理論化学と計算機化学について講述する．無機結晶を対象とした電子構造の解釈，非晶質固体を対象とした分子動力学シミュレーションの原理とシミュレーションによって得られる結果と実験との対比などを説明する.

分光法を用いた無機固体の構造解析（3回）
さまざまな分光法の原理を説明し，無機固体への適用例を説明する．具体的には，光吸収と蛍光スペクトル，赤外およびラマン分光，核磁気共鳴，電子スピン共鳴，メスバウアー分光などを解説し，これらの分光法が無機固体の構造解析においてどのような情報を提供するかを述べる.

回折法を用いた無機固体の構造解析（2回）
X線回折を中心に，解説法の原理と結晶の構造解析の基礎を講述する．X 線を用いた他の構造解析，すなわち，XPS，EXAFSなどについても触れる．また，電子顕微鏡の原理についても解説する．これらの構造解析の手法を具体的な無機固体に適用した例も述べる.

ナノ構造材料（2回）
光ファイバーやフォトニック結晶など，特にフォトニクスの分野で注目されている無機材料を取り上げ，ナノ構造が機能を発現する原理とナノ構造の作製方法について講述する.

マイクロ構造材料（2回）
高温セラミックスや電子セラミックスなどの実用セラミックスのマイクロ構造と発現する機能について講述する.

Continue to 無機構造化学 (2)↓↓↓

**無機構造化学 (2)**

**[Class requirement]**

京都大学工学部工業化学科「無機化学（創成化学）」程度の無機固体化学に関する入門的講義の履修を前提としている.

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

レポートの結果に基づいて判定する.

**[Textbook]**

授業で配布するプリントを使用する.

**[Reference books, etc.]**

（Reference books）
特になし

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

講義の内容に関して予め自ら専門書などで理解を深めるとともに、講義の終了後は学習した内容を配布されたプリントなどで確認すること。

**（Others (office hour, etc.)）**

隔年開講科目．化学系6専攻の旧課程ならびに化学系6専攻以外の専攻の受講生には，追加レポートを課す.

*Please visit KULASIS to find out about office hours.

| Numbering code | G-ENG12 6H022 LJ60 | | |
|---|---|---|---|
| Course title <English> | 有機天然物化学<br>Chemistry of Organic Natural Products | Affiliated department, Job title,Name | Graduate School of Engineering<br>Professor,NAKAO YOSHIAKI |

| Target year | | Number of credits | 1.5 | Course offered year/period | 2019/Second semester |
|---|---|---|---|---|---|

| Day/period | Thu.1 | Class style | Lecture | Language | Japanese |
|---|---|---|---|---|---|

**[Outline and Purpose of the Course]**

天然由来の高次構造を有する有機分子を対象にして，その生合成経路、生物活性などについて講述する

**[Course Goals]**

講義概要で述べたことがらを習得し，天然由来の有機化合物の生合成経路とそれらの生理活性が理解できるようになる.

**[Course Schedule and Contents]**

生合成における有機化学反応（1回）
生体中で酵素によって触媒される有機化学反応について，生合成を理解するうえで重要なものに絞って解説する.

酢酸ーマロン酸経路（3回）
酢酸ーマロン酸経路によって生じる有機化合物の生合成経路と生理活性などについて解説する.

シキミ酸経路（2回）
シキミ酸経路によって生じる有機化合物の生合成経路と生理活性などについて解説する.

メバロン酸ーMEP経路（3回）
メバロン酸ーMEP経路によって生じる有機化合物の生合成経路と生理活性などについて解説する.

アミノ酸経路（2回）
アミノ酸経路によって生じる有機化合物の生合成経路と生理活性などについて解説する.

**[Class requirement]**

京都大学工学部工業化学科「有機化学I~III(創成化学)」を履修していることを前提とする.

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

毎講義小テストを行うとともに，期末試験の結果に基づいて判定する.

**[Textbook]**

随時プリントを配付する.

**[Reference books, etc.]**

（Reference books）
Paul M. Dewick 『Medicinal Natural Products: A Biosynthetic Approach,, 』 （Wiley, 2009）

Continue to 有機天然物化学 (2)↓↓↓

**有機天然物化学 (2)**

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

**必要に応じて指示する**

**（Others (office hour, etc.)）**

*Please visit KULASIS to find out about office hours.

| Numbering code | G-ENG12 5H031 LJ62 | | |
|---|---|---|---|
| Course title <English> | 生体材料化学<br>Chemistry of Biomaterials | Affiliated department, Job title,Name | Graduate School of Engineering<br>Senior Lecturer,OOMAE MASASHI |

| Target year | | Number of credits | 1.5 | Course offered year/period | 2019/Second semester |
|---|---|---|---|---|---|

| Day/period | Tue.2 | Class style | Lecture | Language | Japanese |
|---|---|---|---|---|---|

**[Outline and Purpose of the Course]**

生物機能を意識した材料には，1）多成分が有機的に関係して現れる高度な機能、および，2） 35億年をかけた進化の結果，地球環境に優しいシステムとして機能発現している，の二つの重要な観点が必要である．生物機能を分子レベルで学びながら，その特徴を指向した，あるいは，模倣した材料創成の現状と将来について解説する．

**[Course Goals]**

生体機能は多岐にわたり、その背景にある戦術には、持続的社会を形成する際に極めて重要なポイントが多々ある。このようなバイオの視点に基づく、材料開発にとって重要な考え方を習得することを目標とする。

**[Course Schedule and Contents]**

材料観点からの生体機能（6回）
生体における機能として，1） 運動，2） エネルギー変換，3） 感覚，4） 自己複製，5）情報処理，を取り上げ，その合理性や特色を分子レベルで紹介する．各項目に関連する人工的なシステムや材料の現状を取り上げ，生体機能の発現機構と比較しながら評価を行う．さらに，生体機能を指向した未来材料について概説する．

生体と多糖とのコミュニケーション（6回）
糖類の構造と分類など、機能を理解するための基礎知識について説 明する。(1回）
複合糖質の基礎として、生物界において糖質が機能発現する複合糖質について説明する。（2回）
糖質と疾患として、糖質が様々な疾患に関連する生体分子であることを説明する。(2回）
糖質の材料利用について、糖質の機能を利用した材料応用研究と産業利用されている糖質について説明する。(1回）

**[Class requirement]**

None

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

試験あるいはレポートと出席を加味して評価する．

**[Textbook]**

配布するレジュメを使用する．

**[Reference books, etc.]**

（Reference books）
特になし

Continue to 生体材料化学 (2)↓↓↓

**生体材料化学 (2)**

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

未入力

**（Others (office hour, etc.)）**

*Please visit KULASIS to find out about office hours.

| Numbering code | G-ENG12 6H034 LJ61 | | |
|---|---|---|---|
| Course title <English> | 材料解析化学II<br>Analysis and Characterization of Materials II | Affiliated department, Job title,Name | Graduate School of Engineering<br>Professor,OOTSUKA KOUJI<br>Graduate School of Engineering<br>Associate Professor,OYAMA MUNETAKA<br>Graduate School of Engineering<br>Associate Professor,KUBO TAKUYA |

| Target year | | Number of credits | 1.5 | Course offered year/period | 2019/Second semester |
|---|---|---|---|---|---|

| Day/period | Wed.2 | Class style | Lecture | Language | Japanese |
|---|---|---|---|---|---|

**[Outline and Purpose of the Course]**

極微細構造をもつナノマテリアルの創製など，近年の材料科学分野の進展には顕著なものがある。これら新規材料の評価を行うためには分析・計測技術の革新的な進歩が必須である。本講義では最先端技術を駆使した材料解析化学のフロンティアについて講述する。

**[Course Goals]**

材料解析分野における最新の先端機器分析手法について，原理と概略および応用を理解する。

**[Course Schedule and Contents]**

高速微小分離分析法（4回）
高性能迅速分離分析法であるキャピラリー電気泳動をさらに高速化・微小化し，極めて短時間に高性能分離を実現するマイクロチップ分離分析手法（マイクロチップ電気泳動／液体クロマトグラフィー）について，原理ならびに応用例を講述する。

金属ナノ粒子を用いた分析化学（3回）
金属ナノ粒子は分析化学の分野でも近年新しい機能性材料として利用されている。このような金属ナノ粒子の特性や化学調製法について解説した後、その分析化学への応用、特に修飾電極における電子移動および電極触媒素子としての利用について講述する。

実試料分析のための分離剤設計（3回）
生体試料や環境試料を扱う際に必要となる固相抽出剤設計において，分離選択性を付与する手法や得られた分離剤の性能評価法について講述する。

最先端材料解析技術／学習到達度の確認（1回）
材料解析化学技術の最新の技術革新についてトピックス的に紹介する。あわせて学習到達度の確認を行う。

定期試験等の評価のフィードバック（1回）
定期試験等の評価のフィードバックを行う。

Continue to 材料解析化学II (2)↓↓↓

**材料解析化学II (2)**

**[Class requirement]**

京都大学工学部工業化学科「分析化学（創成化学）」，「機器分析化学（創成化学）」，「最先端機器分析（創成化学）」程度の分析化学および機器分析に関する講義を修得していることが望ましい。

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

定期試験成績およびレポート・小テストを総合して評価する。

**[Textbook]**

適宜プリントを配布する。

**[Reference books, etc.]**

**（Reference books）**

Introduced during class

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

毎授業後に内容について精査・復習することが望ましい。

**（Others (office hour, etc.)）**

隔年講義。2019年度開講。

*Please visit KULASIS to find out about office hours.

未更新

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 材料化学特別実験及演習<br>Laboratory and Exercise in Material Chemistry | Affiliated department, Job title,Name | Graduate School of Engineering<br>Professor,FUJITA KOUJI |

| Target year | | Number of credits | 8 | 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]**

,60times,

**[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.

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 先端マテリアルサイエンス通論（4回コース）<br>Introduction to Advanced Material Science and Technology (4 times course) | Affiliated department, Job title,Name | Graduate School of Engineering<br>Senior Lecturer,YOROZU KAZUAKI<br>Graduate School of Engineering<br>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]

Topic I Organic Materials
Week 1, Tumor imaging and therapy through photoirradiation
Week 2, Carbon nanorings
Week 3, Synthesis of novel pai-conjugated molecules with main group elements
Week 4, Chemistry of asymmetric catalysis - stereoselective synthesis of opically 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 cuting, 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

## [Class requirement]

Each topic consists of four lectures.
This course requests to choose one topic from provided three topics in advance.
It is prohibited to change the topic 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.

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 becouse 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.

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 先端マテリアルサイエンス通論（8回コース）<br>Introduction to Advanced Material Science and Technology (8 times course) | Affiliated department, Job title,Name | Graduate School of Engineering<br>Senior Lecturer,YOROZU KAZUAKI<br>Graduate School of Engineering<br>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]

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]

Topic I Organic Materials
Week 1, Tumor imaging and therapy through photoirradiation
Week 2, Carbon nanorings
Week 3, Synthesis of novel pai-conjugated molecules with main group elements
Week 4, Chemistry of asymmetric catalysis - stereoselective synthesis of opically 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 cuting, 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

## [Class requirement]

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.

Continue to 先端マテリアルサイエンス通論（8回コース）(2)↓↓↓

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 becouse 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）<br>Introduction to Advanced Material Science and Technology (12 times course) | Affiliated department, Job title,Name | Graduate School of Engineering<br>Senior Lecturer,YOROZU KAZUAKI<br>Graduate School of Engineering<br>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]

Topic I Organic Materials
Week 1, Tumor imaging and therapy through photoirradiation
Week 2, Carbon nanorings
Week 3, Synthesis of novel pai-conjugated molecules with main group elements
Week 4, Chemistry of asymmetric catalysis - stereoselective synthesis of opically 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 cuting, 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

## [Class requirement]

Each topic consists of four lectures.
This course requests to take all provided three topics.
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.

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

The average score of the best two assignments for each topics is employed.
For each topic, the students must attend minimum three lectures and submit minimum two assignments

Continue to 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 becouse 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.

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 現代科学技術特論（4回コース）<br>Advanced Modern Science and Technology (4 times course) | Affiliated department, Job title,Name | Graduate School of Engineering<br>Senior Lecturer,ASHIDA RIYUUICHI<br>Graduate School of Engineering<br>Senior Lecturer,MATSUMOTO RIYOUSUKE<br>Graduate School of Engineering<br>Senior Lecturer,MAEDA MASAHIRO<br>Graduate School of Engineering<br>Senior Lecturer,YOROZU KAZUAKI<br>Graduate School of Engineering<br>Senior Lecturer,KANEKO KENTAROU |

| Target year | | Number of credits | 0.5 | Course offered year/period | 2019/Second semester |
|---|---|---|---|---|---|
| Day/period | Thu.5 | Class style | Lecture | Language | English |

## [Outline and Purpose of the Course]

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. Group discussions will be done for further understanding of the topics of the course.

## [Course Goals]

The students understand of each technology towards social issues to be solved by engineers. In addition, the students learn the importance for engineers to have multidisciplinary mind and understand the significance of engineering to realize sustainable development.

## [Course Schedule and Contents]

Topic I Computer-Aided Analyses for Fluid
Week 1-2, Lagrangian Meshfree Methods as New Generation Computational Tools
Week 3, CFD in Process Systems Engineering
Week 4, CFD in Hydraulic Engineering
Topic II Utilization of Light Energy
Week 5-6, Photochemistry of Organic Molecules
Week 7, Solar Energy Conversion Using Semiconductor Photocatalysts
Week 8, Efficiency Improvement in Solar Cells by Photonic Nano Structures
Topic III Materials Analysis
Week 9-10,Crystal Structure Analysis by Power X-ray Diffraction Measurement
Week 11-12, Principles and Applications of Fluorescence Spectroscopy

## [Class requirement]

Each topic consists of four lectures.
This course requests to choose one topic from provided three topics in advance.
It is prohibited to change the topic after registration.

## [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".

Continue to 現代科学技術特論（4回コース）(2)↓↓↓

**現代科学技術特論（4回コース）(2)**

**[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 becouse 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.

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 現代科学技術特論（8回コース）<br>Advanced Modern Science and Technology (8 times course) | Affiliated department, Job title,Name | Graduate School of Engineering<br>Senior Lecturer,ASHIDA RIYUUICHI<br>Graduate School of Engineering<br>Senior Lecturer,MATSUMOTO RIYOUSUKE<br>Graduate School of Engineering<br>Senior Lecturer,MAEDA MASAHIRO<br>Graduate School of Engineering<br>Senior Lecturer,YOROZU KAZUAKI<br>Graduate School of Engineering<br>Senior Lecturer,KANEKO KENTAROU |

| Target year | | Number of credits | 1 | Course offered year/period | 2019/Second semester |
|---|---|---|---|---|---|
| Day/period | Thu.5 | Class style | Lecture | Language | English |

## [Outline and Purpose of the Course]

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. Group discussions will be done for further understanding of the topics of the course.

## [Course Goals]

The students understand of each technology towards social issues to be solved by engineers. In addition, the students learn the importance for engineers to have multidisciplinary mind and understand the significance of engineering to realize sustainable development.

## [Course Schedule and Contents]

Topic I Computer-Aided Analyses for Fluid
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Week 3, CFD in Process Systems Engineering
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Topic II Utilization of Light Energy
Week 5-6, Photochemistry of Organic Molecules
Week 7, Solar Energy Conversion Using Semiconductor Photocatalysts
Week 8, Efficiency Improvement in Solar Cells by Photonic Nano Structures
Topic III Materials Analysis
Week 9-10,Crystal Structure Analysis by Power X-ray Diffraction Measurement
Week 11-12, Principles and Applications of Fluorescence Spectroscopy

## [Class requirement]

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.

## [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".

Continue to 現代科学技術特論（8回コース）(2)↓↓↓

**現代科学技術特論（8回コース）(2)**

**[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 becouse 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> | 現代科学技術特論（12回コース）<br>Advanced Modern Science and Technology (12 times course) | Affiliated department, Job title,Name | Graduate School of Engineering<br>Senior Lecturer,ASHIDA RIYUUICHI<br>Graduate School of Engineering<br>Senior Lecturer,MATSUMOTO RIYOUSUKE<br>Graduate School of Engineering<br>Senior Lecturer,MAEDA MASAHIRO<br>Graduate School of Engineering<br>Senior Lecturer,YOROZU KAZUAKI<br>Graduate School of Engineering<br>Senior Lecturer,KANEKO KENTAROU |

| Target year | | Number of credits | 1.5 | Course offered year/period | 2019/Second semester |
|---|---|---|---|---|---|
| Day/period | Thu.5 | Class style | Lecture | Language | English |

## [Outline and Purpose of the Course]

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. Group discussions will be done for further understanding of the topics of the course.

## [Course Goals]

The students understand of each technology towards social issues to be solved by engineers. In addition, the students learn the importance for engineers to have multidisciplinary mind and understand the significance of engineering to realize sustainable development.

## [Course Schedule and Contents]

Topic I Computer-Aided Analyses for Fluid
Week 1-2, Lagrangian Meshfree Methods as New Generation Computational Tools
Week 3, CFD in Process Systems Engineering
Week 4, CFD in Hydraulic Engineering
Topic II Utilization of Light Energy
Week 5-6, Photochemistry of Organic Molecules
Week 7, Solar Energy Conversion Using Semiconductor Photocatalysts
Week 8, Efficiency Improvement in Solar Cells by Photonic Nano Structures
Topic III Materials Analysis
Week 9-10,Crystal Structure Analysis by Power X-ray Diffraction Measurement
Week 11-12, Principles and Applications of Fluorescence Spectroscopy

## [Class requirement]

Each topic consists of four lectures.
This course requests to take all provided three topics.

Continue to 現代科学技術特論（12回コース）(2)↓↓↓

**現代科学技術特論（12回コース）(2)**

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

The average score of the best two assignments for each topics is employed.
For each topic, the students 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 becouse 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.

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 実践的科学英語演習Ⅰ<br>Exercise in Practical Scientific English I | Affiliated department, Job title,Name | Graduate School of Engineering<br>Senior Lecturer,NISHIKAWA MIKAKO<br>Graduate School of Engineering<br>Senior Lecturer,MATSUMOTO RIYOUSUKE<br>Graduate School of Engineering<br>Senior Lecturer,ASHIDA RIYUUICHI<br>Graduate School of Engineering<br>Senior Lecturer,MAEDA MASAHIRO<br>Graduate School of Engineering<br>Senior Lecturer,YOROZU KAZUAKI<br>Graduate School of Engineering<br>Senior Lecturer,KANEKO KENTAROU |

| Target year | | Number of credits | 1 | Course offered year/period | 2019/First semester |
|---|---|---|---|---|---|
| Day/period | Thu.4,5 | Class style | Seminar | Language | Japanese and English |

**[Outline and Purpose of the Course]**

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.

**[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 Schedule and Contents]**

Unit 1. Course Overview
Introduction to writing scientific research articles

Unit 2. Introduction
Raising awareness of the register of scientific 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 (2)
Paraphrasing ideas from source texts, using citations and references in formal writing

Unit 5. Writing Processes (1) Abstract
Identifying the moves for an Abstract section by hint expressions

Unit 6. Writing Processes (2) Abstract-continued
Writing an Abstract (Title), Peer Feedback

Unit 7. Writing Processes (3) Introduction

Continue to 実践的科学英語演習Ⅰ(2)↓↓↓

**実践的科学英語演習Ⅰ(2)**

Identifying the moves for an Introduction section by hint expressions

Unit 8. Writing Processes (4) Introduction-continued
Writing an Introduction section, Peer Feedback

Unit 9. Writing Processes (5) Method
Writing a Method section, Peer Feedback

Unit 10. Writing Processes (6) Results
Writing a Result section, Peer Feedback

Unit 11. Writing Processes (7) Discussions and Conclusion
Writing a Discussion and a Conclusion section

Unit 12. Cover letter to reviewers
Writing a cover letter to reviewers and how to respond to reviewers

Unit 13. Monitoring and Revising (1)
Submitting the paper online to receive feedback from instructors

Unit 14. Monitoring and Revising (2)
Revising a paper based on peer feedback

Unit 15. Submission of the Final Paper

**[Class requirement]**

Students who intend to join this course must attend the first class.

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

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

**[Textbook]**

Handout materials will be supplied by the instructor.

**[Reference books, etc.]**

**（Reference books）**
Textbooks (for reference)

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.

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

**Continue to 実践的科学英語演習Ⅰ(3)↓↓↓**

**実践的科学英語演習Ⅰ(3)**

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

Students will need to spend a reasonable amount of time to complete their own piece of writing for the course.

**（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-day guidance.

Office Hours: (by appointment) nishikawa.mikako7w@kyoto-u.ac.jp (Ext. 2052)

*Please visit KULASIS to find out about office hours.

未更新

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 安全衛生工学（4回コース）<br>Safety and Health Engineering (4 times course) | Affiliated department, Job title,Name | Agency for Health, Safety and Environment<br>Professor,HASHIMOTO SATOSHI<br>Agency for Health, Safety and Environment<br>Associate Professor,MATSUI YASUTO |

| Target year | | Number of credits | 0.5 | 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,

**[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.

未更新

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 安全衛生工学（11回コース）<br>Safety and Health Engineering (11 times course) | Affiliated department, Job title,Name | Agency for Health, Safety and Environment<br>Professor,HASHIMOTO SATOSHI<br>Agency for Health, Safety and Environment<br>Associate Professor,MATSUI YASUTO |

| Target year | | Number of credits | 1.5 | 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,

**[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.

| Numbering code | G-ENG13 6H042 LJ60　G-ENG12 6H042 LJ60　G-ENG15 6H042 LJ60 |
|---|---|

| Course title <English> | 有機金属化学２<br>Organotransition Metal Chemistry 2 | Affiliated department, Job title,Name | Graduate School of Engineering Professor,NAKAO YOSHIAKI<br>Graduate School of Engineering Professor,MURAKAMI MASAHIRO<br>Graduate School of Engineering Professor,KONDOU TERUYUKI<br>Graduate School of Engineering Professor,OOUCHI MAKOTO<br>Graduate School of Engineering Associate Professor,MIKI KOUJI<br>Graduate School of Engineering Associate Professor,KURAHASHI TAKUYA<br>Graduate School of Engineering Associate Professor,FUJIHARA TETSUAKI |
|---|---|---|---|

| Target year | | Number of credits | 1.5 | Course offered year/period | 2019/First semester |
|---|---|---|---|---|---|

| Day/period | Fri.1 | Class style | Lecture | Language | Japanese |
|---|---|---|---|---|---|

**[Outline and Purpose of the Course]**

遷移金属錯体の合成法、構造的特徴、および重要な素反応と、それらの反応機構について解説する。また、隔年開講の「有機金属化学１」と連続的に講義を進め、遷移金属錯体を用いる触媒反応の有機合成化学、有機工業プロセスへの応用について解説する。

**[Course Goals]**

遷移金属錯体の化学についての基礎知識を習得する。また、それぞれの遷移金属錯体に特徴的な触媒反応の有機合成化学、有機工業プロセスへの応用について理解する。

**[Course Schedule and Contents]**

遷移金属錯体 I～III(3回)
① 遷移金属錯体の構造（形式酸化数、１８電子則、配位子の種類、ハプト数など），② 遷移金属錯体の反応（配位子置換反応、酸化的付加、還元的脱離、トランスメタル化など）
③ 遷移金属錯体の反応（挿入、脱離、配位子に対する求核剤の反応、酸化的環化など）

不飽和結合の反応 I～III(3回)
① ヒドロシアノ化、ヒドロアミノ化、ヒドロメタル化、カルボメタル化反応など。
② アルキン多量化、Pauson-Khand 反応、骨格異性化など
③ アルキンやアルケンの求電子的活性化を経る反応、カルベン錯体の反応、メタセシス

カップリング反応 I,II(2回)
① C-C 結合形成（酸化的カップリング、還元的カップリング、クロスカップリング、辻ートロスト型反応）、C-ヘテロ元素結合形成（C-O, C-N, C-B, C-Si 形成,
② C-C 結合形成（ヘック反応、藤原-守谷反応、C-H アリール化）

不活性結合活性化(1回)
C-H活性化（村井反応、ホウ素化、ヒドロアシル化、カルベン・ナイトレン挿入など）、C-C 活性化

重合(1回)

Continue to 有機金属化学２ (2)↓↓↓

**有機金属化学２ (2)**

**配位重合、メタセシス重合、リビングラジカル重合、クロスカップリング重合**

**工業的反応(1回)**
Reppe **反応、ヒドロホルミル化、**Fischer-Tropsch **法、**Monsant **法、アルコールの空気酸化、ワッカー酸化など**

**[Class requirement]**

None

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

**学期末に行う筆記試験にて評価する。**

**[Textbook]**

Not used

**[Reference books, etc.]**

**（Reference books）**
**山本明夫『有機金属化学－基礎と応用』（裳華房** (1982)）
From Bonding to Catalysis, John F『Organotransition Metal Chemistry』（Hartwig, University Science Books (2010)）
**山本明夫『有機金属化学－基礎から触媒反応まで』（東京化学同人** (2015)）
**小澤文幸，西山久雄『有機遷移金属化学』（朝倉書店** (2016)）

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

**必要に応じて指示する**

**（Others (office hour, etc.)）**

*Please visit KULASIS to find out about office hours.

未更新

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 先端科学機器分析及び実習Ⅰ<br>Instrumental Analysis,Adv.I | Affiliated department, Job title,Name | Graduate School of Engineering<br>Professor,OOE KOUICHI |

| Target year | | Number of credits | 1 | Course offered year/period | 2019/First semester |
|---|---|---|---|---|---|
| Day/period | Thu.4,5 | Class style | Seminar | Language | Japanese |

**[Outline and Purpose of the Course]**

**[Course Goals]**

**[Course Schedule and Contents]**

,1time,
,1time,
,1time,
,1time,
,1time,
,1time,
,2times,
,2times,

**[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.

未更新

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 先端科学機器分析及び実習II<br>Instrumental Analysis,Adv.II | Affiliated department, Job title,Name | Graduate School of Engineering<br>Professor,OOE KOUICHI |

| Target year | | Number of credits | 1 | Course offered year/period | 2019/Second semester |
|---|---|---|---|---|---|
| Day/period | Thu.4,5 | Class style | Seminar | Language | Japanese |

**[Outline and Purpose of the Course]**

**[Course Goals]**

**[Course Schedule and Contents]**

,1time,
,2times,
,2times,
,2times,
,2times,
,2times,

**[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.

| Numbering code | G-ENG12 6P057 LB62 | | |
|---|---|---|---|
| Course title <English> | 材料化学特論第三<br>Material Chemistry Adv. III | Affiliated department, Job title,Name | Graduate School of Engineering<br>Professor,FUJITA KOUJI |

| Target year | | Number of credits | 0.5 | Course offered year/period | 2019/Intensive, First semester |
|---|---|---|---|---|---|
| Day/period | Intensive | Class style | Lecture | Language | Japanese and English |

**[Outline and Purpose of the Course]**

材料化学の各専門分野におけるトピックスについて、集中講義の形式で学修する。なお、材料化学専攻以外の専攻所属の学生は、履修に際して材料化学専攻長に説明を受けること。

**[Course Goals]**

先端材料の合成と構造－物性相関を中心に、基礎から応用まで材料化学分野の現状および将来の展望についての知識を得る。

**[Course Schedule and Contents]**

トピックス講述（4回）
材料化学の各専門分野におけるトピックスについての集中講義。

**[Class requirement]**

None

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

授業時に課すレポート及び履修後に課すレポートにより評価する。

**[Textbook]**

Instructed during class

**[Reference books, etc.]**

（Reference books）
特になし。

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

必要に応じ指示する

**（Others (office hour, etc.)）**

*Please visit KULASIS to find out about office hours.

| Numbering code | G-ENG12 6P058 LB62 | | |
|---|---|---|---|
| Course title <English> | 材料化学特論第四<br>Material Chemistry Adv. IV | Affiliated department, Job title,Name | Graduate School of Engineering<br>Professor,FUJITA KOUJI |

| Target year | | Number of credits | 0.5 | Course offered year/period | 2019/Intensive, Second semester |
|---|---|---|---|---|---|

| Day/period | Intensive | Class style | Lecture | Language | Japanese and English |
|---|---|---|---|---|---|

**[Outline and Purpose of the Course]**

材料化学の各専門分野におけるトピックスについて、集中講義の形式で学修する。なお、材料化学専攻以外の専攻所属の学生は、履修に際して材料化学専攻長に説明を受けること。

**[Course Goals]**

先端材料の合成と構造－物性相関を中心に、基礎から応用まで材料化学分野の現状および将来の展望についての知識を得る。

**[Course Schedule and Contents]**

トピックス講述（4回）
材料化学の各専門分野におけるトピックスについての集中講義。

**[Class requirement]**

None

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

授業時に課すレポート及び履修後に課すレポートにより評価する。

**[Textbook]**

Instructed during class
特になし。

**[Reference books, etc.]**

（Reference books）
特になし。

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

必要に応じ指示する

**（Others (office hour, etc.)）**

*Please visit KULASIS to find out about office hours.

未更新

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 材料化学総論<br>General Material Chemistry | Affiliated department, Job title,Name | Graduate School of Engineering<br>Professor,FUJITA KOUJI |

| Target year | | Number of credits | 0.5 | Course offered year/period | 2019/Intensive, First semester |
|---|---|---|---|---|---|
| Day/period | Intensive | Class style | Lecture | Language | Japanese |

**[Outline and Purpose of the Course]**

**[Course Goals]**

**[Course Schedule and Contents]**

,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.

未更新

| Numbering code | | | |
|---|---|---|---|
| Course title <English> | 化学産業特論<br>Chemical Industry, Advanced | Affiliated department, Job title,Name | Graduate School of Engineering<br>Professor,FUJITA KOUJI |

| Target year | | Number of credits | 0.5 | Course offered year/period | 2019/Intensive, First semester |
|---|---|---|---|---|---|
| Day/period | Intensive | Class style | Lecture | Language | Japanese |

**[Outline and Purpose of the Course]**

**[Course Goals]**

**[Course Schedule and Contents]**

,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.

| Numbering code | G-LAS00 80001 LJ20 | | |
|---|---|---|---|
| Course title <English> | 研究倫理・研究公正（理工系）<br>Research Ethics and Integrity(Science and Technology) | Affiliated department, Job title,Name | Institute for Liberal Arts and Sciences<br>Program-Specific Professor,ITO SHINZABUROU<br>Institute for Liberal Arts and Sciences<br>Program-Specific Professor,SATOU TOORU<br>Graduate School of Engineering<br>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・<br>Intensive, First semester |
|---|---|---|---|---|---|

| Day/period | Intensive | Target year | Graduate students | Eligible students | For science students |
|---|---|---|---|---|---|

**[Outline and Purpose of the Course]**

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に研究を進めるか、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。

**[Course Goals]**

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。

**[Course Schedule and Contents)]**

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－
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
第２講　研究成果を発表する際の研究倫理公正
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）
第３講　知的財産と研究費の適正使用
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<br>Basics of Academic Information Literacy | Affiliated department, Job title,Name | Institute for Liberal Arts and Sciences<br>Professor,KITA HAJIME<br>Kyoto University Library<br>Associate Professor,KITAMURA YUMI<br>Academic Center for Computing and Media Studies<br>Program-Specific Senior Lecturer,FLANAGAN, BrendanJohn<br>Academic Center for Computing and Media Studies<br>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・<br>Intensive, First semester |
|---|---|---|---|---|---|
| Day/period | Intensive | Target year | Graduate students | Eligible students | For all majors |

**[Outline and Purpose of the Course]**

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。

**[Course Goals]**

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。

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。

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。

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。

**[Course Schedule and Contents)]**

以下、４回の授業を集中講義形式で実施する。

・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<br>Introduction to Information Science | Affiliated department, Job title,Name | Graduate School of Informatics<br>Professor,YAMAMOTO AKIHIRO<br>Graduate School of Informatics<br>Professor,KASHIMA HISASHI<br>Graduate School of Informatics<br>Professor,NISHIDA TOYOAKI<br>Graduate School of Informatics<br>Professor,KUROHASHI SADAO<br>Graduate School of Informatics<br>Professor,KAWAHARA TATSUYA<br>Graduate School of Informatics<br>Professor,NISHINO KO<br>Academic Center for Computing and Media Studies<br>Professor,OKABE YASUO<br>Academic Center for Computing and Media Studies<br>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・ディジタル化・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<br>Presentation for Graduate Students | Affiliated department, Job title,Name | Institute for Liberal Arts and Sciences<br>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・<br>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:

- 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.

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**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.)]**