Liberal Arts and Sciences to learn in English

2018
Message from the Director

Takashi Muranaka
Director / Institute for Liberal Arts and Sciences

 Against a background of ongoing technological advancement and the drive for globalization, our current era is characterized by rapid social change. Students living through this time are expected to help shape the future of our societies. The Institute for Liberal Arts and Sciences was established in April 2013 with a view to educating those students to become globally oriented individuals who can function effectively anywhere in the world by exercising their broad perspectives, extensive knowledge, and unparalleled creativity. The Institute aspires to “teach the basic knowledge and methodologies that are common among a wide range of cross-disciplinary fields and foster rich humanity by providing students with opportunities to come into contact with advanced learning and culture” (Article 3, Kyoto University Institute for Liberal Arts and Sciences Regulations).

Throughout its more than 100-year history, Kyoto University has fostered a tradition of academic freedom under the banner of “self-teaching and self-learning” based on dialogue. At the core of this time-honored tradition is the immutable conviction that learning is a process of uncovering hitherto unrecognized issues through self-thinking, experience, and free dialogue, and of opening up new intellectual horizons by inquiring into humanity, society, and natural phenomena according to fundamental principles. Of course, it is also important to have an attitude of respectfully learning from the wisdom of those who have come before us. In addition, I expect our students to aim higher in their endeavors to investigate the unknown and create something new. To this end, it is necessary to shift the direction of advanced learning away from efficient absorption of existing knowledge and toward creation of new knowledge through intensive research. “Self-teaching and self-learning” based on dialogue is a new intellectual habit of learning that must be acquired, and one that will make it possible to take the first step into academia. The primary goal of Kyoto University’s liberal arts and sciences programs is to create an intellectual space that is free, open, and conducive to the taking of that initial step.

Rapid progress in academic research means that specialized fields are becoming increasingly segmented. Meanwhile, the global community is being confronted with issues that involve different specialized fields. In order to resolutely tackle these issues, it is not enough to merely study one’s specialized subject; one must have a broad knowledge base which enables events to be observed from various perspectives. We hope that students from different faculties will come together to freely discuss and learn the knowledge and ideas that underpin the wide variety of subjects concerning humanity, society, and nature that are offered in our liberal arts and sciences courses. Our goal is to see our students enhance their own educational experience while deepening their mutual ties with others.

For students to be able to play active roles in the global arena, it is also important to communicate and live in harmony with people from around the globe with different values, cultures, and lifestyles. To address this fundamental requirement, the Institute emphasizes education in English and other languages through such measures as improving the quality and quantity of classes taught in English by foreign faculty members. We have also introduced support programs for students who wish to study abroad so that they can explore their potential in the international arena.

The Institute will remain committed to providing students with quality liberal arts and sciences education through close collaboration with all of Kyoto University’s faculties and the generous cooperation of its graduate schools, research institutes, and centers. It is our sincere hope that students will learn a great deal from our intellectually stimulating classes, taught by highly enthusiastic teachers, and through candid, unconstrained discussion with fellow students, and that they will enhance their capabilities before launching themselves into the big, wide world that awaits them.

Takashi Muranaka
Director / Institute for Liberal Arts and Sciences
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**Humanities and Social Sciences (Regions and Cultures)**

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**Natural Sciences (Data Science)**

**Informatics**
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**Health and Sports Sciences**

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**Career Support (International Communication)**

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### How to read Syllabi

**シラバスの見方**

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### ※1

平成24年度以前入学者の群を表記しています。平成24年度以前入学者については、この欄に記載した群により、学部ごとに修得すべき全学共通科目の単位数が決められています。

### ※2

ここに掲載されているシラバスは、各科目の概要を伝えるものです。科目を選択する際の参考にしてください。実際の授業は、教員と参加する学生によって作られていくものです。そのため、授業の進行状況や受講生の習熟度などによって、「授業計画と内容」、「到達目標」、「成績評価の方法・観点及び達成度」が変わる場合があります。それらの変更については、教員が授業の中で受講生に直接伝えることを原則としています。

Syllabi in this booklet describe each course. Please refer to it when you select courses. Instructors and students who attend make the actual course. Therefore, “Course schedule and Contents” and “Method, Point of view, and Attainment levels of Evaluation” might be changed due to the progress of the course or proficiency level of the students. In that case, instructor should directly inform students about the change as a general rule.
[Outline and Purpose of the Course]
This course is designed as an introduction to the history of eastern philosophical and religious thought. We will begin with a reading of early Indian Vedic literature and then turn our focus to Zoroastrianism and early and later forms of Buddhism, including Japanese Buddhism.

[Course Goals]
By the end of this course, students will have gained a basic understanding of eastern philosophical and religious thought by learning how to respond to readings in this field in a critical manner.

[Course Schedule and Contents]
The course schedule is divided into the following four sections, each with a different theme. We will spend about three to four weeks on each section. Questions and readings will be regularly assigned to help you assimilate the material discussed in class lectures.

1. Hindu Thought
   The Vedas and Upanishads

2. Zoroastrianism

3. Buddhist Thought
   Early Buddhist thought; dependent origination; Abhidharma literature; the appearance of Mahayana Buddhism; Madhyamaka; Yogacara; Vasubandhu

4. Japanese Buddhism

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Grades are based on attendance (30%), class participation (20%), and assignments/exams (50%). Important: If you miss four or more classes, you will not be given credit for the course.

[Textbook]
Relevant materials will be provided in class.

Lecture code: H149001
<table>
<thead>
<tr>
<th>Course title</th>
<th>History of Modern Science-E2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affiliated department, Job title, Name</td>
<td>Graduate School of Asian and African Area Studies, Associate Professor, D’SOUZA, Rohan Ignatious</td>
</tr>
<tr>
<td>Group</td>
<td>Humanities and Social Sciences</td>
</tr>
<tr>
<td>Field(Classification)</td>
<td>Philosophy(Foundations)</td>
</tr>
<tr>
<td>Number of weekly time blocks</td>
<td>1</td>
</tr>
<tr>
<td>Class style</td>
<td>Lecture</td>
</tr>
<tr>
<td>Course offered year/period</td>
<td>2018 • First semester</td>
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<tr>
<td>Day/period</td>
<td>Tue.3</td>
</tr>
<tr>
<td>Target year</td>
<td>All students</td>
</tr>
<tr>
<td>Eligible students</td>
<td>For all majors</td>
</tr>
</tbody>
</table>

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

Broadly, in part one (semester: April-September), the course will introduce students to some of the main historiographical debates about the origins and defining features of modern science. The central effort here is to familiarise students both at the level of the biographical details of the main thinkers and the significant ideas that comprise our current understandings and assessments about what constitutes modern science.

**[Course Goals]**

By rehearsing some of the significant historiographical and philosophical debates and discussions on the theme of modern science, this course aims to develop an interdisciplinary ability. The attempt to problematize the “hard sciences” through social science questions and theories will help prepare students to take up innovative and important research projects and also helps them think through the centrality of modern science in their everyday lives.

**[Course Schedule and Contents]**

Each class will comprise a 90 minute session; involving a lecture of 60 minutes and followed by a 30 minute interactive discussion in which student participation will also be elicited through either group or individual presentations.

Four themes will be covered in this class and each theme will be covered in three to four weeks.

- a) Plato’s (429?-347 B.C.E.) Forms and Aristotle’s (384-322 B.C.E.) Empiricism
- b) The Scientific Revolution
- c) Colonial Science
- d) Scientific Nationalism

**[Class requirement]**

None

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

There will be a regular cycle of written submissions and feedback through class discussions and teacher evaluations. The idea is to develop a credible capacity for reading and writing amongst those who take up the course.

Evaluations will be based on class presentations, writing assignments and a tutorial.

Details are explained during class.

**[Textbook]**

Not used

**[Reference book, etc.]**

*Reference book*


(Relevant sections and chapters from the above books will be assigned as readings for the course. Other reading materials such as articles or short write-ups may be included based on class discussions and interest.)

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

Students will be expected to have read at least five pages of pre-assigned reading, at the very minimum, before attending each class.

**[Others (office hour, etc.)]**

Students can meet me during office hours with prior appointment.
[Outline and Purpose of the Course]
Logic is the study of arguments and actions taken based on the validity of those arguments.

Students of all disciplines will learn how to transform natural language (English, Japanese, etc.) into symbolic representations, and use those representations to assess the validity of arguments. The content of the course is applicable to both study and everyday thought processes.

This course will cover arguments that can be described by sentential logic.

Students will actively practice
1) transforming English sentences into their symbolic representation,
2) assessing the representations logically, and
3) transforming the conclusion of logical arguments back to natural English.

[Course Goals]
(1) Students will be able to capture the intent/meaning of English language documents or statements and represent the meaning symbolically.
(2) Students will be able to derive logical conclusions from a document, and detect examples of poor or incorrect logic.
(3) Students will practice creating documents in natural English language based on logical argument, with emphasis on creating English that is easy to interpret. After completion of the course, students should acquire improved English expression skill.

[Course Schedule and Contents]
(1~2) Course overview: what is an argument, and what makes an argument valid?
(3~4) Classes of valid and incorrect arguments, sentence forms, logical connectives, conversion of simple sentences to symbols
(5~6) Truth table definitions of AND, OR, and NOT, argument analysis by truth table, conditional and biconditional truth tables
(7~9) Deductive logic rules, introduction to proofs
(10~11) Deductive proofs using non-conditional rules
(12~13) Proofs including conditional rules
(14) Summary and review

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Attendance (25%), Quizzes (35%), final examination (40%).

[Textbook]
Not used

[Reference book, etc.]
Gustason  Elemen...
# Theories of Religion in the Social Sciences-E2

## Affiliated department, Job title, Name
- Center for Southeast Asian Studies
- Associate Professor, Julius Bautista

## Group
- Humanities and Social Sciences

## Field(Classification)
- Philosophy(Foundations)

## Language
- English

## Old group
- Group A

## Number of credits
- 2

## Number of weekly time blocks
- 1

<table>
<thead>
<tr>
<th>Class style</th>
<th>Course offered year/period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>2018 • First semester</td>
</tr>
</tbody>
</table>

## Day/period
- Tue. 4

## Target year
- Mainly 1st & 2nd year student

## Eligible students
- For liberal arts students

## Outline and Purpose of the Course

The course offers a basic foundation for the study of religion by introducing a number of different perspectives from the Sciences and Humanities. Religions are conceived of as part of the history of ideas that shaped the major intellectual traditions such as science, politics, cultural and social studies. The course will cultivate two learning areas: (1) a basic understanding of the approaches and methodologies that have been used in the study of religious phenomena, and (2) a critical discussion of the various religious, moral and ethical issues that influence contemporary ideas and discoveries.

## Course Goals

At the end of this course, students will be able to (1) describe how some of the world’s major thinkers and intellectuals have engaged with the topic of religion over the past two centuries. From this intellectual platform, students will be equipped to (2) describe how the concept of religion itself has evolved in ways that is relevant to the various social, cultural and environmental conditions in which it can be observed.

## Course Schedule and Contents

- **Week 1**: Introduction and Course Queries
- **Week 2**: Religion as an Academic Field of Study
- **Week 3**: Religion and the formation of Social Sciences
- **Week 4**: Anthropological Approaches to Religion
- **Week 5**: Religion and the Sociological Imagination
- **Week 6**: Religion as a Psychological Problem
- **Week 7**: Religion and the formation of Politics
- **Week 8**: Recap Lecture/Midterm
- **Week 9**: Materialist Approaches
- **Week 10**: Interpretive Approaches
- **Week 11**: Science and the new Atheism
- **Week 12**: Secular Humanism
- **Week 13**: Conclusion and Recap
- **Week 14**: Reading Week
- **Week 15**: Examination
- **Week 16**: Feedback Week

## Class requirement

None

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

Students will be evaluated according to three main criteria. (1) their ability to participate class discussion (25% of the overall grade), (2) a written essay (35%), and (3) group project/presentation (40%). **The group project/presentation may be replaced by a written exam, depending on class numbers. This will be announced when the final number of enrollment is confirmed.**

### Textbook
- Kessler, Gary (Fifty Key Thinkers on Religion) (Routledge) ISBN:415492610

### Reference book, etc.
- Introduced during class

### Regarding studies out of class (preparation and review)

No prior knowledge of religion is required. Students should be able to participate in discussions with their classmates in English. This may be face-to-face small group discussion or online. Students may also be asked to make short presentations in English based on the class topics.

### Others (office hour, etc.)

Consultation is by appointment via email to bautista@cseas.kyoto-u.ac.jp

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Lecture code: H159001
[Outline and Purpose of the Course]

This course provides an introduction to methods for understanding and evaluating religious ideas and practices, focusing in particular on modern approaches such as evolutionary biology and cognitive psychology to address the question of where religious beliefs come from and why we find them so compelling.

[Course Goals]

By the end of this course, students will have gained a basic understanding of the scientific study of religion, learning how to respond to readings in this field in a critical manner.

[Course Schedule and Contents]

After an introduction to the course, each class will be based around addressing the following two questions:
1. Why do we have religious beliefs?
2. How can religious beliefs be explained using the tools of anthropology, evolutionary biology, and cognitive psychology?

[Class requirement]

None

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

Grades are based on attendance (30%), class participation (20%), and assignments/exams (50%). Important: If you miss four or more classes, you will not be given credit for the course.

[Textbook]

Relevant materials will be provided in class.

[Reference book, etc.]

[Introduced during class]

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

In general, readings will be assigned on a weekly basis, and you will be expected to prepare sufficiently before each class.

[Others (office hour, etc.)]

Office hours to be specified (check KULASIS). For questions about the course or to set up a meeting, email me at catt.adam.7c@kyoto-u.ac.jp. Please include "Religion" in the mail header and your full name and student number in the email. Important: Make sure that you search for answers to questions yourself before contacting me by email.
[Outline and Purpose of the Course]
This section of the course will introduce students to some of the Philosophical debates that have troubled the notion of modern science. The central effort, however, is to introduce the study of these philosophical problems as aspects of historiographical concern. That is, to urge students to discuss the relationships between philosophy and modern science in biographies and historical contexts in understanding how philosophy has helped set up the interrogation of modern science.

[Course Goals]
By rehearsing some of the significant historiographical and philosophical debates and discussions on the theme of modern science, this course aims to develop an interdisciplinary ability. The attempts to problematize the “hard sciences” through social science questions and theories will help prepare students to take up innovative and important research projects and also helps them think through the centrality of modern science in their everyday lives.

[Course Schedule and Contents]
Each class will comprise a 90 minute session; involving a lecture of 60 minutes and followed by a 30 minute interactive discussion in which student participation will also be elicited through either group or individual presentations.
Four themes will be covered in this class and each theme will be covered in three to four weeks.

a) Karl Popper and the ‘Problem of Demarcation’
b) Thomas Kuhn and ‘Normal Science’, ‘Progress’ and the ‘Paradigm’
c) Paul Feyerabend ‘Against Method’
d) Realism and their Discontents

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
There will be a regular cycle of written submissions and feedback through class discussions and teacher evaluations. The idea is to develop a credible capacity for reading and writing amongst those who take up the course.
Evaluations will be based on class presentations, writing assignments and a tutorial. Details are explained during class.

[Textbook]
Not used

[Reference book, etc.]
(Relevant sections and chapters from the above books will be assigned as readings for the course. Other reading materials such as articles or short write-ups may be included based on class discussions and interest.)

[Regarding studies out of class (preparation and review)]
Students will be expected to have read at least five pages of pre-assigned reading, at the very minimum, before attending each class.

[Others (office hour, etc.)]
Students can meet me during office hours with prior appointment.
Course title: Logic II-E2

Group: Humanities and Social Sciences
Field(Classification): Philosophy(Foundations)

Language: English

Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 · Second semester

Day/period: Wed. 1
Target year: Mainly 1st & 2nd year students
Eligible students: For all majors

[Outline and Purpose of the Course]
Students will expand their study of symbolic logic to incorporate quantitative elements in logical reasoning. In addition to the basic "if-then", "and", "or", and "not" logical connectives covered in Logic I, the course will add the use of variables and their application to logical argument. This includes concepts such as "there exists" or "for all". The course will provide ample time for study and discussion of quantitative logical proofs. Similar to Logic I, transformation of natural language to symbolic representation, logical deduction and reasoning in symbolic form, and translation of the conclusions from quantitative logic back to high-quality English will all be covered.

[Course Goals]
(1) Students will acquire the ability to assess an argument in order to determine the unique or general nature of the elements of the argument.
(2) Students will be able to solve quantitative logic proofs, resulting in the ability to prove the existence or non-existence of something, or an actionable conclusion as a result of a proof.
(3) Students will practice and acquire enhanced ability to write clear, systematic English documents that are unambiguous and present a logical system of reasoning.

[Course Schedule and Contents]
(1-3) Review: sentential logic and truth tables, deductive proofs
In-class exercises: deductive proofs and conversion of natural English to symbolic form.

(4-6)
Introduction to quantificational logic
Variables, "exists", and "for all" elements
Conversion of natural English to quantificational logic symbols
Quantificational logic symbolic representation

(7-10)
Quantificational logic proofs: introduction and semantics
Quantificational logic: existential instantiation and existential generalization
Quantificational logic: universal instantiation and universal generalization
Quantificational logic: quantifier negation, and proof exercises

(11) Logic proofs strategies
Strategies and techniques for solving logical proofs

[Outline and Purpose of the Course] (Cont.)
(12-14) Modern applied logic, with consideration of the "Semantic Web"
(15) Exam: solution of quantitative logic proofs, writing of essay/document describing a problem, the symbolic representation of the problem, logical proof, and writing of the logical conclusion derived from proof.

[Class requirement]
Students are _STRONGLY_ recommended to take Logic I before this course.
(Self-study of Chapters 1-3 of the reference text before taking this course is possible.)

Logic Iを履修することを強く推薦する。
（参考書のChapter 1-3を独学した場合もLogic IIを履修することが可能。）

[Method, Point of view, and Attainment levels of Evaluation]
Attendance (25%), quizzes (35%), final exam (40%)

[Textbook]
Not used

[Reference book, etc.]

[Regarding studies out of class (preparation and review)]
Students should review weekly course material. Students may need to practice solving challenging proofs outside of class.

[Others (office hour, etc.)]

Lecture code: H156001
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<tr>
<th>Course title</th>
<th>Western History I-E2 Western History I-E2</th>
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<tbody>
<tr>
<td>Affiliated department, Job title, Name</td>
<td>Graduate School of Human and Environmental Studies Program-Specific Senior Lecturer, BHATTE, Pallavi Kamlakar</td>
</tr>
<tr>
<td>Group</td>
<td>Humanities and Social Sciences</td>
</tr>
<tr>
<td>Language</td>
<td>English</td>
</tr>
<tr>
<td>Field(Classification)</td>
<td>History and Civilization(Foundations)</td>
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<td>Number of weekly time blocks</td>
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<td>Lecture</td>
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<td>Course offered year/period</td>
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<td>Day/period</td>
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<td>Target year</td>
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<td>Eligible students</td>
<td>For all majors</td>
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</table>

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

This is an introductory undergraduate course, providing students a basic narrative of British ascendancy and expansionism in India during the late eighteenth century to the twentieth century. This is a contents based course taught in English.

**[Course Goals]**

The goals of this course is to help students to (a) compare alternative and compelling views and interpretations and assess their significance, (b) become familiar with key debates of the period, (c) assess primary sources in the light of historical research and (d) present arguments clearly and concisely both orally and on paper.

**[Course Schedule and Contents]**

Week 1: Introduction to the course and Overview  
Week 2/3: The Mughals; Emerging European presence in India  
Week 4/5: Establishment of Company Rule  
Week 6/7: The Colonizer and the Indigenous People  
Week 8/9: Rebellion and Revolt: The Mutiny of 1857-58  
Week 10/11: Social Reform Movements  
Week 12/13: Nationalism and Communism  
Week 14: Independence and Partition  
Week 15: Final examination  
Week 16: Feedback & Summary

*Note: The schedule may change slightly depending on class requirements.*

**[Class requirement]**

None

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

Students are evaluated by the exam provided after the course.

**[Textbook]**

Not used  
Lecture notes will be distributed in class.

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

No prior knowledge of history is required. Students should be able to participate in discussions with their classmates in English.

**[Others (office hour, etc.)]**

No office hours specified. Meetings are to be arranged by appointment.  
Classroom Management:  
Be respectful to everyone and everything in class.

Lecture code: H275001

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<table>
<thead>
<tr>
<th>Course title</th>
<th>Western History I-E2 Western History I-E2</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Graduate School of Human and Environmental Studies Program-Specific Senior Lecturer, BHATTE, Pallavi Kamlakar</td>
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<td>Day/period</td>
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<tr>
<td>Target year</td>
<td>All students</td>
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</table>

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

This is an introductory undergraduate course, providing students a basic narrative of British ascendancy and expansionism in India during the late eighteenth century to the twentieth century. This is a contents based course taught in English.

**[Course Goals]**

The goals of this course is to help students to (a) compare alternative and compelling views and interpretations and assess their significance, (b) become familiar with key debates of the period, (c) assess primary sources in the light of historical research and (d) present arguments clearly and concisely both orally and on paper.

**[Course Schedule and Contents]**

Week 1: Introduction to the course and Overview  
Week 2/3: The Mughals; Emerging European presence in India  
Week 4/5: Establishment of Company Rule  
Week 6/7: The Colonizer and the Indigenous People  
Week 8/9: Rebellion and Revolt: The Mutiny of 1857-58  
Week 10/11: Social Reform Movements  
Week 12/13: Nationalism and Communism  
Week 14: Independence and Partition  
Week 15: Final examination  
Week 16: Feedback & Summary

*Note: The schedule may change slightly depending on class requirements.*

**[Class requirement]**

None

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

Students are evaluated by the exam provided after the course.

**[Textbook]**

Not used  
Lecture notes will be distributed in class.

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

No prior knowledge of history is required. Students should be able to participate in discussions with their classmates in English.

**[Others (office hour, etc.)]**

No office hours specified. Meetings are to be arranged by appointment.  
Classroom Management:  
Be respectful to everyone and everything in class.

Lecture code: H275002
Introduction to World Religions-E2(2)

announced when the final number of enrollment is confirmed.

[Textbook]

[Reference book, etc.]
Introduced during class

[Reference book]

[Regarding studies out of class (preparation and review)]
No prior knowledge of religion is required. Students should be able to participate in discussions with their classmates in English. This may be face-to-face small group discussion or online. Students may also be asked to make short presentations in English based on the class topics.

[Others (office hour, etc.)]
Consultation is by appointment via email to bautista@cseas.kyoto-u.ac.jp

Course title
Introduction to World Religions-E2

Affiliated department, Job title, Name
Center for Southeast Asian Studies Associate Professor, Julius Bautista

Group
Humanities and Social Sciences

Field(Classification)
History and Civilization(Foundations)

Language
English

Old group Group A

Number of credits
2

Number of weekly time blocks
1

Class style Lecture

Course offered year/period 2018 • First semester

Day/period Tue. 2

Target year Mainly 1st & 2nd year students

Eligible students For liberal arts students

[Outline and Purpose of the Course]
This course offers an introduction to major religions of the world, including Hinduism, Buddhism, Eastern Religions, Judaism, Christianity, and Islam. What is interesting about the origin and historical development of each religious tradition? What are their sacred texts, philosophical ideas and common values? What kinds of rituals are performed by the members of each faith? The purpose of this course is to answer these questions in a way that compares various World Religions, especially in light of the global forces that have shaped them.

[Course Goals]
This course has two main learning outcomes: The first (1) is the ability to offer a comparative analysis of the origin and historical development of each of the world’s major religions, drawing from basic understanding of sacred texts, philosophical ideas and patterns of ritual worship. Secondly, (2) students will have the ability to comment on how religion impacts upon a wide range of social, political and cultural issues that affects modern society around the globe.

[Course Schedule and Contents]
Week 1 Introduction and Course Queries
Week 2 Monotheism: The Founding Narratives
Week 3 The Judeo-Christian Tradition
Week 4 Jesus Christ and Christianity
Week 5 The Prophet of Islam
Week 6 Islam and the Submission to God
Week 7 The Vedic Tradition: The Foundational Narratives
Week 8 Hinduism in Traditional and Contemporary Society
Week 9 Buddhism: The Path Towards Enlightenment
Week 10 The Buddha and His Dharma
Week 11 East Asian Religious Traditions 1
Week 12 East Asian Religious Traditions 2
Week 13 Conclusion and Recap
Week 14 Reading Week
Week 15 Examination
Week 16 Feedback Week

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Students will be evaluated according to three main criteria. (1) their ability to participate class discussion (25% of the overall grade), (2) a written essay (35%), and (3) group project/presentation (40%). ***The group project/presentation may be replaced by a written exam, depending on class numbers. This will be announced when the final number of enrollment is confirmed.***
# Outline and Purpose of the Course

This course will offer an introduction to premodern Japanese history (~1600) from a global perspective. That is, we will approach the Japanese archipelago not as an isolated territory that seamlessly transformed into the nation state as we now know it, but as a geographical hub that has been shaped by various foreign encounters through the centuries. We will look at how trade, war, diplomacy and ideas fostered international connections that have played crucial roles in deciding the trajectory of Japan’s development.

# Course Goals

Upon the successful completion of this course, students will:
1. have a general understanding of the major periods and events of Japanese premodern history.
2. gain a sensibility for the way in which the history of nation states is intimately bound up with, and cannot be told separately from global events.

# Course Schedule and Contents

Course themes per week:
1. Introduction
2. Prehistory
3. Jomon
4. Yayoi and Kofun
5. Early State Formation I
6. Early State Formation II
7. Imperial Period
8. (Midterm Exam)
9. Mongol Invasion I
10. Mongol Invasion II
11. East Asia War I
12. East Asia War II
13. Christianity I
14. Christianity II

# Class requirement

As a survey introduction class, this course will require no reading preparations, but competence in English is required to fruitfully engage in class and exams. Furthermore, although not a strict requirement, it is recommended that the student will either precede or follow up this class with Japanese History II - E2. Moreover, students should be aware of the fact that student interest in this course always exceeds its capacity and that enrollment permission will be decided based on a random lottery.

---

**Course title: Japanese History I-E2**

**Affiliated department, Job title, Name:** Graduate School of Education, Associate Professor, Niels van Steenpaal

**Group:** Humanities and Social Sciences

**Field (Classification):** History and Civilization (Foundations)

**Language:** English

**Old group:** Group A

**Number of weekly time blocks:** 1

**Class style:** Lecture

**Course offered year/period:** 2018 • First semester

**Day/period:** Tue.2

**Target year:** All students

**Eligible students:** For all majors

**Number of credits:** 2

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

Grading will be based on attendance, participation, a midterm and a final exam as follows:

- 20% Attendance & Participation
- 30% Midterm Exam
- 50% Final Exam

**Textbook**

Not used

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

Review of class notes.

**Others (office hour, etc.)**

By appointment only.

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Lecture code: H281001
Western History II-E2(2)

[Textbook]
- Not used
- No textbook; Lecture notes will be distributed in class.

[Reference book, etc.]
- (Reference book)
  - Introduced during class
  - To be announced in class.

[Regarding studies out of class (preparation and review)]
- No prior knowledge of history is required. Students should be able to participate in discussions with their classmates in English.

[Others (office hour, etc.)]
- No office hours specified. Meetings are to be arranged by appointment.
- Classroom Management:
  - Be respectful to everyone and everything in class.

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**Course title**: Western History II-E2

**Affiliated department, Job title, Name**: Graduate School of Human and Environmental Studies, Program-Specific Senior Lecturer, BHATTE, Pallavi Kamlakar

**Field (Classification)**: History and Civilization (Foundations)

**Group**: Humanities and Social Sciences

**Language**: English

**Number of weekly time blocks**: 1

**Day/period**: Tue. 2

**Course offered year/period**: 2018 • Second semester

**Number of credits**: 2

**Target year**: All students

**Eligible students**: For all majors

---

[Outline and Purpose of the Course]

This is an introductory undergraduate course, providing students a basic narrative of major turning points that shaped modern Europe from the late 18th-century through the present, including the cause and the course of the two world wars. This is a contents based course taught in English. The purpose of this course is to develop (a) an understanding of some of the principle themes in modern Western History, and (b) an ability to analyze historical evidence and historical interpretation, and (c) an ability to express historical understanding verbally.

[Course Goals]

One of the goals of this course is to help students to consider multiple accounts of historical events in order to understand international relations from a variety of perspectives. Besides nurturing their English reading, writing and communication skills, the ultimate goal of this course is to provide a platform for students to discuss history in English.

[Course Schedule and Contents]

Week 1: Introduction to the course and Overview
- Week 2/3: The French Revolution and Napoleon
- Week 4/5: The Industrial Revolution and Pax Britannica
- Week 6/7: World War I
- Week 8/9: Interwar period and the rise of Fascist Italy, Germany and Japan
- Week 10/11: World War II
- Week 12/13: The Cold War
- Week 14: Post Cold War and the Contemporary Era
- Week 15: Final examination
- Week 16: Feedback & Summary of the Course

*Note: The schedule may change slightly depending on class requirements.

[Class requirement]

There are no prerequisites. This course is open to all students regardless of major. Enthusiasm and willingness to participate and share ideas in class is necessary.

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

Students are evaluated by the exam provided after the course.
### Course title
Western History II-E2

### Affiliated department
Graduate School of Human and Environmental Studies

### Job title, Name
Program Specific Senior Lecturer, BHATTE, Pallavi Kamlakar

### Group
Humanities and Social Sciences

### Field (Classification)
History and Civilization (Foundations)

### Language
English

### Old group
Group A

### Number of credits
2

### Number of weekly time blocks
1

### Class style
Lecture

### Course offered year/period
2018 • Second semester

### Day/period
Fri.2

### Target year
All students

### Eligible students
For all majors

### [Outline and Purpose of the Course]
This is an introductory undergraduate course, providing students a basic narrative of major turning points that shaped modern Europe from the late 18th-century through the present, including the cause and the course of the two world wars. This is a contents based course taught in English. The purpose of this course is to develop (a) an understanding of some of the principle themes in modern Western History, and (b) an ability to analyze historical evidence and historical interpretation, and (c) an ability to express historical understanding verbally.

### [Course Goals]
One of the goals of this course is to help students to consider multiple accounts of historical events in order to understand international relations from a variety of perspectives. Besides nurturing their English reading, writing and communication skills, the ultimate goal of this course is to provide a platform for students to discuss history in English.

### [Course Schedule and Contents]

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*Note: The schedule may change slightly depending on class requirements.

### [Class requirement]
There are no prerequisites. This course is open to all students regardless of major. Enthusiasm and willingness to participate and share ideas in class is necessary.

### [Method, Point of view, and Attainment levels of Evaluation]
Students are evaluated by the exam provided after the course.
This course will introduce students to Asian history and civilization. While each of these regions has its own distinctive identities, we shall consider how overlapping historical, political and cultural experiences have engendered a shared sense of heritage and common destiny. We will examine the struggles of Asians to protect or regain their sovereignty, and establish their identities in a rapidly arising and often volatile world order. We will look at how individuals in Asia respond to significant issues and challenges in four distinct historical themes: "Pre-modern ideologies in Asia", "Euro-American Imperialism", "War and Conflict in Asia" and the "Era of the modern state and regionalism."

At the end of this course, students will be able to achieve the following learning outcomes: (1) The ability to provide an historical portrait of the interrelationships between Asian societies and the wider global forces that have shaped the region. (2) The ability to engage in critical discussion and debate on some of the most pressing regional issues, including those in the areas of politics, the environment, history, culture and security.

Lecture 1 will be an introduction to the course and its assessment tasks. Lectures 2, 3 and 4 will be devoted to a discussion of pre-modern forms of Asian civilizational ideologies and how they remain relevant in contemporary society. Lectures 5, 6 and 7 will discuss the impact of Euro-American incursion in the region from the sixteenth century, particularly in the pursuit of natural resources and trading routes. We shall discuss Asian responses to changing power relations, as well as how resistance to foreign incursion cultivated ethnic and religious identity in this period. Lectures 8, 9 and 10 will examine the major modern conflicts in the region, particularly the two world wars, and how this impacted upon the pursuit of sovereignty and self determination among Asians. Lectures 11, 12 and 13 will examine the era of the nation state, including the formation of cultural nationalism in the region in the post-war period. We shall examine the formation of various forms of governance and how this relates to national identity. We shall then discuss the moves towards regional integration among Asian nations, and how Asians are looking to the future in light of globalization. Lecture 14 will be a conclusion and summary of the major themes of the course. Lectures 15 and 16 will be devoted to examinations, and feedback for the course.

No prior knowledge of Asian studies is required. Students should be able to participate in discussions with their classmates in English. This may be face-to-face small group discussion or online. Students may also be asked to make short presentations in English based on the class topics.

Consultation is by appointment via email to bautista@cseas.kyoto-u.ac.jp
This course is an exploration into how religion impacts upon some of the major social, cultural, political and economic issues of today's world. We shall be focusing on specific case studies relating to religious fundamentalism, religious pluralism, new religious movements and spirituality from around the world. Specific attention will also be paid to considering how the rise of information technology and social media impact religious belief and practice. We consider case studies in inquiring into how religion influences the pursuit of knowledge and scientific inquiry, including questions of ethics and morality in a rapidly globalizing world.

**Course Goals**

This course has two main learning outcomes for students: (1) the ability to assess how religion has figured as a critical factor in some of the major political and social issues facing the world today and (2) the ability to express an informed opinion on the themes of science and modernity, religious violence, extremism, radicalization and revivalism among others.

**Course Schedule and Contents**

- Week 1: Introduction and Course Queries
- Week 2: Religion and the Contemporary New Order
- Week 3: Globalization and Religious Belief 1
- Week 4: Globalization and Religious Belief 2
- Week 5: Secularization and Modernity 1
- Week 6: Secularization and Modernity 2
- Week 7: Religion and Technology
- Week 8: Religion, the Internet and Social Media
- Week 9: Faith, Knowledge and Scientific Reason 1
- Week 10: Faith, Knowledge and Scientific Reason 2
- Week 11: Spirituality and New Religious Movements 1
- Week 12: Spirituality and New Religious Movements 2
- Week 13: Conclusion and Recap
- Week 14: Reading Week
- Week 15: Examination
- Week 16: Feedback Week

**Class requirement**

None

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

Students will be evaluated according to three main criteria. (1) their ability to participate class discussion (30% of the overall grade), (2) a written essay (35%), and (3) group project/presentation (35%). The group project/presentation may be replaced by a written exam, depending on class numbers. This will be announced when the final number of enrollment is confirmed.

**Reference book**

Instructed during class

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

No prior knowledge of religion is required. Students should be able to participate in discussions with their classmates in English. This may be face-to-face small group discussion or online. Students may also be asked to make short presentations in English based on the class topics.

**Others (office hour, etc.)**

Consultation is by appointment via email to bautista@cseas.kyoto-u.ac.jp
This course will offer an introduction to early modern and modern Japanese history (1600–1911) from a global perspective. That is, we will approach the Japanese archipelago not as an isolated territory that seamlessly transformed into the nation state as we now know it, but as a geographical hub that has been shaped by various “foreign” encounters through the centuries. We will look at how trade, war, diplomacy and ideas fostered international connections that have played crucial roles in deciding the trajectory of Japan’s development. As a survey introduction class, this course will require no reading preparations, but competence in English is required to fruitfully engage in class discussion.

Upon the successful completion of this course, students will:
1. have a general understanding of the major periods and events of early modern and modern Japanese history.
2. gain a sensibility for the way in which the history of nation states is intimately bound up with, and cannot be told separately from global events.

Course themes per week:
1. Introduction
2. Tokugawa Order
3. Maritime Prohibition
4. The Dutch
5. The Zheng Family
6. Ryukyu & Ezo
7. Rise of the West
8. (Midterm Exam)
9. Opium Wars
10. Opening Japan
11. Meiji Restoration
12. Sino-Japanese War
13. Russo-Japanese War I
14. Russo-Japanese War II

As a survey introduction class, this course will require no reading preparations, but competence in English is required to fruitfully engage in class and exams. Furthermore, although not a strict requirement, it is recommended that the student will either precede or follow up this course with Japanese History I - E2.

Moreover, students should be aware of the fact that student interest in this course always exceeds its capacity. It is recommended that the student will either precede or follow up this course with Japanese History I - E2.

Grading will be based on attendance, participation, a midterm and a final exam as follows:
20% Attendance & Participation
30% Midterm Exam
50% Final Exam

Review of class notes.

By appointment only.
Japanese Intellectual History I–E2(2)

[Class requirement]
Competence in reading academic literature and in discussing its content in English is a prerequisite for this course. Furthermore, although not a strict requirement, it is recommended that the student will either precede or follow up this course with Japanese Intellectual History II - E2.

Moreover, students should be aware of the fact that student interest in this course sometimes exceeds its capacity in which case enrollment permission will be decided based on a random lottery.

[Method, Point of view, and Attainment levels of Evaluation]
Grading will be based on attendance, participation, class reports, and a term research paper as follows:
30% Attendance and Participation
30% Class Reports
40% Research Paper

[Textbook]
Not used

[Regarding studies out of class (preparation and review)]
(1) read the assigned readings (20-30 pages)
(2) prepare a "reading sheet" for each reading
(3) prepare a "report sheet" one or two times during the semester
(4) write a term research paper

[Others (office hour, etc.)]
By appointment only.

This course will introduce the student to the "intellectual history" of the Tokugawa and Meiji periods (1600-1911), both as a body of knowledge, and as a particular historical method. That is, besides deepening our understanding of the philosophies, ideologies, and mentalities that helped shape this period, we will also develop the skills necessary to meaningfully examine these ideas as academic problems. Through class discussion based on research literature, primary sources, and in-class presentations, we will reconstruct the way in which Tokugawa and Meiji contemporaries thought (or did not think) about a wide range of issues such as prostitution, discrimination, gender, education and the nation.

Upon the successful completion of this course, students will:
1) be familiar with the presuppositions and narratives of historical trends such as Marxism and modernization theory.
2) have a general understanding of early modern Japanese history as well as some of the ideas and ideologies that defined this particular period.
3) be able to efficiently and effectively distil the essence of academic writing, and structure and present one's own ideas in a lucid manner.
4) be able to pose meaningful historical questions, and conduct independent research according to the methodological requirements of intellectual history.

Course activities per week:
1. Introduction
2. Reading Assignments
3. Reading 1 (Orientalism)
4. Reading 2 (Nation-State)
5. Topic Discussion
6. Reading 3 (Kabuki)
7. Reading 4 (Publishing)
8. Proposal Discussion
9. Proposal Discussion
10. Reading 5 (Prostitution)
11. Reading 6 (Race)
12. Presentations
13. Presentations
14. Presentations

Lecture code: H283001
Japanese Intellectual History II-E2(2)

[Class requirement]
Competence in reading academic literature and in discussing its content in English is a prerequisite for this course. Furthermore, although not a strict requirement, it is recommended that the student will either precede or follow up this course with Japanese Intellectual History I - E2.

Moreover, students should be aware of the fact that student interest in this course sometimes exceeds its capacity in which case enrollment permission will be decided based on a random lottery.

[Method, Point of view, and Attainment levels of Evaluation]
Grading will be based on attendance, participation, class reports, and the term paper as follows:
- 30% Attendance and Participation
- 30% Class Reports
- 40% Research Paper

[Textbook]
Not used

[Regarding studies out of class (preparation and review)]
(1) read the assigned readings (20-30 pages)
(2) prepare a "reading sheet" for each reading
(3) prepare a "report sheet" one or two times during the semester
(4) write a term research paper

[Others (office hour, etc.)]
By appointment only.

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This course will introduce the student to the “intellectual history” of Japan up to the early modern period (~1600), both as a body of knowledge, and as a particular historical method. That is, besides deepening our understanding of the philosophies, ideologies, and mentalities that helped shape this period, we will also develop the skills necessary to meaningfully examine these ideas as academic problems. Through class discussion based on research literature, primary sources, and in-class presentations, we will reconstruct the way in which premodern Japanese thought (or did not think) about a wide range of issues such as morality, death, gender, and the state.

[Course Goals]
Upon the successful completion of this course, students will:
1. be familiar with the presuppositions and narratives of historical trends such as Marxism and modernization theory.
2. have a general understanding of premodern Japanese history as well as some of the ideas and ideologies that defined this particular period.
3. be able to efficiently and effectively distil the essence of academic writing, and structure and present one's own ideas in a lucid manner.
4. be able to pose meaningful historical questions, and conduct independent research according to the methodological requirements of intellectual history.

[Course Schedule and Contents]
Course activities per week:
1. Introduction
2. Reading Assignments
3. Reading 1 (Ritsuryo Confucianism)
4. Reading 2 (Confucianism as a Religion)
5. Topic Discussion
6. Reading 3 (Honji Suijaku)
7. Reading 4 (Yoshida Shinto)
8. Proposal Discussion
9. Proposal Discussion
10. Reading 5 (Hungry Ghosts)
11. Reading 6 (Coping with Death)
12. Presentations
13. Presentations
14. Presentations

Lecture code: H284001
**Course title:** Intercultural Communication II-E2

**Affiliated department, Job title, Name:** Center for Southeast Asian Studies
Associate Professor, BADENOCH, Nathan

**Group:** Humanities and Social Sciences
**Field (Classification):** Arts, Literature and Linguistics (Foundations)

**Language:** English

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<td>Lecture</td>
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**Day/period:** Mon. 4

**Target year:** All students

**Eligible students:** For all majors

**Number of credits:** 2

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### Outline and Purpose of the Course

This class is the second of two introducing the concepts and practices of Intercultural Communication. In this semester, we will look at how culture and identity are represented in language use in the contemporary world. In this current age of globalization, communication styles are changing rapidly, and there are major implications for how languages and dialects are used. In particular, we will be concerned with how global English interfaces with the linguistic diversity of the world. While there is a general understanding that English is taking over the world, the reality is not so simple. We will explore the complexity of language use around the world, using a selection of podcasts and other audio-visual materials on a range of topics.

### Course Goals

In this class we will deepen our understanding of how language is used in a world of increasingly complex social interactions. In particular, it is expected that students will develop a more nuanced view on how English, national languages, minority languages and dialects co-exist in our daily lives. The format of the course will bring the focus on our own communication skills, using audio materials that will be discussed in the group.

### Course Schedule and Contents

- **Week 1:** Intercultural Communication: Language, culture and identity in a globalized world
- **Week 2:** Linguistic Diversity: A world of languages, languages of the world
- **Week 3:** Language or Dialect?: Social prestige and language choice
- **Week 4:** Multilingualism: How many languages can you speak, and why?
- **Week 5:** Language as a Window on Culture: What do you see differently?
- **Week 6:** Code Switching and The Myth of a Pure Language
- **Week 7:** Bilingual Education: The pros and perceived cons
- **Week 8:** Language Loss: What do the last speakers experience?
- **Week 9:** Language Revival: Can languages be revitalized? Should they be?
- **Week 10:** Internet: Sociolinguistics of digital communication
- **Week 11:** Adaptation or Assimilation?: Language Use Choices of Migrants
- **Week 12:** Gender, Identity and Communication: LGBT language issues
- **Week 13:** Speaking “Proper” English?: Rethinking the global language
- **Week 14:** What Language(s) will Your Grandchildren Speak: Communication and Language Choice into the Future

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**Class requirement:**
There are no course requirements for the class, but students will be required to make regular use of audio materials and do an oral presentation in English.

**Method, Point of view, and Attainment levels of Evaluation:**
Students will be evaluated on attendance (40%), class participation (20%), a group presentation (20%) and an essay examination (20%).

**Textbook:**
Not used

**Reference book, etc.:**
- The World In Words podcast [www.pri.org/programs/world-words](http://www.pri.org/programs/world-words)

**Regarding studies out of class (preparation and review):**
Students will be expected to listen to a podcast and prepare to discuss the contents in class. Each student will be required to collaborate to do a group presentation of one of the weekly topics. Readings will be assigned as supplementary material.

**Others (office hour, etc.):**
Office hours can be arranged as necessary.
Course title: Introduction to Linguistic Science-E2
Affiliated department, Job title, Name: Graduate School of Letters, Associate Professor, CATT, Adam Alvah

Group: Humanities and Social Sciences
Field (Classification): Arts, Literature and Linguistics (Foundations)

Language: English
Old group: Group A
Number of credits: 2

Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • First semester
Day/period: Wed. 1
Target year: All students
Eligible students: For liberal arts students

[Outline and Purpose of the Course]
This course provides a general introduction to the principles of linguistic science. It will introduce each of the core areas of study in the field of linguistics: morphology, syntax, language acquisition, semantics, phonetics, phonology, and language change.

[Course Goals]
After taking this course, students will have a basic understanding of how to critically consider and analyze actual linguistic data from a variety of languages.

[Course Schedule and Contents]
The course schedule is divided into the following seven sections, each with a different theme. Exercises and readings will be regularly assigned to help you explore various descriptive and theoretical issues.

1. Introduction, Morphology (about 2 weeks)
   - What is linguistics?
   - the morpheme; word formation; derivation and inflection; compounding
2. Syntax (about 3 weeks)
   - Grammaticality; rules; constituent structure; phrase structure diagrams; parsing; case marking; agreement; transformations; deep structure and surface structure; wh-movement; constraints in grammar
3. Language Acquisition (about 1 week)
   - Innate knowledge; critical period
4. Semantics (about 2 weeks)
   - Aspects of linguistic meaning; discourse structure; anaphora; reflexive interpretation; operators and scope
5. Phonetics (about 2 weeks)
   - International Phonetic Alphabet; the vowels and consonants of English and Japanese; stress; accent; feature sets
6. Phonology (about 3 weeks)
   - The phoneme; allophones; natural classes; formulating rules; minimal pairs; free variation; underlying and surface representations; rule ordering
7. Language Change: Historical Linguistics (about 1 week)
   - Genetically related languages; proto-languages; sound change; the comparative method; cognates; borrowing

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Grades are based on attendance (30%), class participation (20%), and assignments/exams (50%). Important: If you miss four or more classes, you will not be given credit for the course.

[Textbook]
Relevant materials will be provided in class.

[Reference book, etc.]

[Regarding studies out of class (preparation and review)]
In general, exercises and readings will be assigned on a weekly basis, and you will be expected to prepare sufficiently before each class.

[Others (office hour, etc.)]
Office hours to be specified (check KULASIS). For questions about the course or to set up a meeting, email me at catt.adam.7c@kyoto-u.ac.jp. Please include “Linguistic Science” in the mail header and your full name and student number in the email. Important: Make sure that you search for answers to questions yourself before contacting me by email.
**Introduction to Japanese Linguistics I-E2(2)**

**[Class requirement]**
This course does not require any prerequisite knowledge, although a basic familiarity with Japanese is preferable.

**[Method, Point of view, and Attainment levels of Evaluation]**
Grades are based on attendance (30%), class participation (20%), and assignments/exams (50%). Important: If you miss four or more classes, you will not be given credit for the course.

**[Textbook]**
Relevant materials will be provided in class.

**[Reference book, etc.]**

**[Regarding studies out of class [preparation and review]]**
In general, exercises and readings will be assigned on a weekly basis, and you will be expected to prepare sufficiently before each class.

**[Others (office hour, etc.)]**
Office hours to be specified (check KULASIS). For questions about the course or to set up a meeting, email me at catt.adam.7c@kyoto-u.ac.jp. Please include “Japanese Linguistics” in the mail header and your full name and student number in the email. Important: Make sure that you search for answers to questions yourself before contacting me by email.
Patterns of communication in globalized society are changing rapidly. English as the global language continues to rise, yet the vast majority of the world's people use more than one language in daily life. This course will provide an introduction to the linguistic and cultural foundations of communication in contemporary society. To do this we will look at issues such as the interactions between language and dialect, development of global Englishes, non-verbal communication, emerging forms of multilingualism, language policy within regionalization, language in the global market and the impact of the Internet on linguistic diversity and cross-cultural communication.

[Course Goals]
The objective of this course is to provide an introduction to the theoretical and practical aspects of communication in a diverse world.

[Course Schedule and Contents]
Week 1 Intercultural communication: Definition, scope and processes
Week 2 Linguistic diversity in the world
Week 3 Language in society: Socio-linguistics concepts in practice
Week 4 Language and culture: How we perceive the world
Week 5 Language acquisition in multicultural environments
Week 6 Language use: Social inclusion and exclusion
Week 7 Nonverbal communication
Week 8 Scripts: The technology of written communication
Week 9 Urban linguistic landscapes
Week 10 Global English, local Englishes
Week 11 Nationalism, regionalization and language policy
Week 12 Words in Motion: Culture across time and space
Week 13 Popular culture as regional communication
Week 14 Endangered languages: Psychology and knowledge systems
Week 15 Examination

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Attendance and class participation (40%), individual research paper (60%).
### Course title
Pedagogy I-E2

### Affiliated department, Job title, Name
Graduate School of Education, Associate Professor, Jeremy Rappleye

### Group
Humanities and Social Sciences

### Field(Classification)
Pedagogy, Psychology and Sociology, Foundations

### Language
English

### Number of weekly time blocks
1

#### Class style
Lecture

### Course offered year/period
2018 • First semester

### Number of credits
2

### Eligible students
For all majors

### Target year
Mainly 1st & 2nd year students

### Day/period
Wed. 1

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

This course introduces students to deeper thinking about education, teaching, and learning. It challenges students to contemplate seemingly easy questions: What makes a good school? What is the purpose of education? What is the role of a teacher? Who are the students? What is the future of education? Even though we have all attended school for most of our lives, rarely have we stopped to think seriously about how and what we are taught. This class gives students this chance. As such, it is suitable for all students, regardless of major, year, or future career path.

**[Course Goals]**

The goals of this course are three. First, students will acquire a systematic introduction to the major issues in education: organization of schools, goals, teaching, learning, curriculum, etc. Second, will improve their analytical abilities through a range of critical examinations of course materials (videos, academic articles, media sources, etc.). Third, students will begin to develop advanced skills in discussion and debate: each of the five units of the course will require active, focused discussion.

**[Course Schedule and Contents]**

**Introduction (1 class)**

Part I: What do good schools look like? (4-5 classes) - This section will examine various examples of innovative schools drawn from different cultural contexts, including Summerhill, monasteries, and preschools in Japan and America.

Part II: What is the role of the goal of education? (3-4 classes) - This section will introduce students to 3 broad aims for schooling found throughout the world: economic growth, social equality, and individual development.

Part III: What makes a good teacher? (3-4 classes) - We next turn to look at the different styles of teacher that match the different goals of education discussed in Part II.

Part IV: What should be taught? (2-3 classes) - This section focuses on what is taught, both the explicit and hidden curriculum of schools.

Part V: What will schools look like in the future? (2-3 classes) - Drawing together all the previous sections of the course, we contemplate the future of education, in particular technology and globalization. (15 classes total, 1 Final Exam, 1 Feedback Section)

**[Class requirement]**

There are no requirements for taking this course. However, students are strongly encouraged to also enrol in Advanced Lecture for Pedagogy I at the same time as this course (held directly after this class). These two courses will follow a similar schedule and content, but Pedagogy I focuses more on lecture and discussion, whereas Advanced Lecture for Pedagogy I focuses more on reading and reflection. All lectures will be in English, but the instructor can read and understand Japanese, so questions or comments may occasionally be made in Japanese.

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

Classes will take the form of interactive lecture. Students will be asked to actively give their opinions, reflect on their own experiences as a student, and ask good questions. There will be a lot of time devoted to class discussions. Thus, grading will be heavily weighted towards attendance and participation (30 points for attendance, 20 points for participation in debates at the end of each Part of the course (5 x 4 times). Additional requirements include a 1-2 page reflection paper (10 points) and final evaluation - either final test or paper (40 points). Students absent more than four times will not pass this course.

**[Textbook]**

Not used

There is no textbook for this course. All readings will be distributed by the instructor.

**[Reference book, etc.]**

(Reference book)

All reading and reference material will be distributed in class.

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

Students will be expected to study 2-3 hours outside of class each week for this course.

**[Others (office hour, etc.)]**

Office Hours will be held 1 hour each week (time and place to be announced)
### [Outline and Purpose of the Course]

Sociology can be briefly defined as the science of social interactions, social behaviors, and society. These concepts cover various subthemes such as institutions, power, organizations, stratification, etc., which make sociology a very challenging social science. This lecture presents and discusses the main topics, theories, concepts, and authors in the field of sociology, and provides students with the knowledge and tools to understand the evolution of our contemporary societies and of our everyday behaviors.

### [Course Goals]

The objective is to familiarize students with the main concepts in sociology, in order to be able to understand and analyze the evolutions of contemporary societies. The students will examine various dimensions of societies through the confrontation with real-life sociological problems and the discussion of many case studies, having then a broad introduction to the study of social behaviors. Students will acquire a knowledge and ability to enrich their understanding of social phenomena that both shape and are outgrowths of our behaviors, and for some of them the basis to pursue the learning of social sciences at university.

### [Course Schedule and Contents]

- **Week 1. Course Introduction: the Sociological Imagination**
- **Week 2. Social Research**
- **Week 3. Socialization and Social Interaction**
- **Week 4. Social Structure and Family**
- **Week 5. Culture and Media**
- **Week 6. Capitalism, Economy, and Work**
- **Week 7. Organizations and Institutions**
- **Week 8. Social Stratifications, Class, Inequalities**
- **Week 9. Deviance and Control**
- **Week 10. Race and Ethnicity**
- **Week 11. Power**
- **Week 12. Gender and Sexuality**
- **Week 13. Education and Science**
- **Week 14. Course Conclusions**
- **Week 15. Feedback**

### [Class requirement]

The lectures will be delivered in English. It is not required to have already studied Sociology, but students should have an interest in the phenomena that shape and modify our contemporary societies.

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

Ordinarily, 70% final exam

### [Textbook]

Instructed during class

### [Reference book, etc.]

Reference book introduced during class

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

During each class, the first ten-fifteen minutes are dedicated to the review of the previous class. Students are asked to prepare each lesson on a weekly basis.

### [Others (office hour, etc.)]

Students should email the teacher to make an appointment.

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Lecture code: H721001

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Pedagogy II-E2(2)

[Class requirement]
There are no requirements for taking this course. However, students are strongly encouraged to also enrol in Advanced Lecture for Pedagogy II at the same time as this course. These two courses will follow a similar schedule and content, but Pedagogy II will focus more on providing historical background and overviews of individual thinkers and pedagogical approaches. All lectures will be in English, but the instructor can read and understand Japanese, so questions or comments may occasionally be made in Japanese.

[Method, Point of view, and Attainment levels of Evaluation]
Classes will take the form of interactive lecture. Students will be asked to actively give their opinions, reflect on their own experiences as a student, and ask good questions. Grading will be heavily weighted towards attendance and participation (30 points), writing 4 1-2 page reflection papers (20 points), short final examination (25 points) and 4-5 page final paper (25 points). Students absent more than four times will not pass the course.

[Textbook]
Not used
There is no textbook for this course. All readings will be distributed by the instructor in PDF format

[Reference book, etc.]
J. Palmer (Ed.) 「Fifty Major Thinkers on Education: From Confucius to Dewey」 (Routledge) (* Available online)

[Regarding studies out of class (preparation and review)]
Students will be expected to study 2-3 hours outside of class each week for this course. Four times during the semester, students will need to submit a Reflection Paper (1-2 pages).

[Others (office hour, etc.)]
Office Hours will be held 1 hour each week (time and place to be announced)
**Course title**
Introduction to Comparative Psychology - E2

**Affiliated department, Job title, Name**
Graduate School of Letters, Professor, Anderson, James Russell

**Group**
Humanities and Social Sciences

**Field(Classification)**
Pedagogy, Psychology and Sociology(Issues)

**Language**
English

**Number of weekly time blocks**
1

**Class style**
Lecture

**Course offered year/period**
2018 • First semester

**Number of credits**
2

**Eligible students**
For all majors

**Target year**
All students

**Day/period**
Tue.4

---

**Outline and Purpose of the Course**
Students will become acquainted with the principle reasons for psychologists' interest in the behavior of other species as well as humans, and they will gain knowledge about the major approaches used (observational studies, fieldwork, experimental manipulations) in this field. They will become familiar with the most important researchers in this branch of psychology, the historical contexts of their work, and how their studies have influenced contemporary research. There will be opportunities to ask questions in each class, and to compose short-answer questions.

**Course Goals**
Students will learn about major psychological approaches to understanding learning and behavior of humans and other species. Topics will include classical and operant conditioning, advanced cognition, and social and mating systems.

**Course Schedule and Contents**
1. Background to classical and operant conditioning
2. Learning: sensitive periods, preparedness, and applications
3. The ethological approach to animal behavior. Tinbergen's 4 questions
4. Early development: nature and nurture
5. Early development: the formation and disruption of social attachments
6. The impact of early experience on behavioral adjustment
7. Living in groups: costs and benefits 1
8. Living in groups: costs and benefits 2
9. Matting systems: humans and other species
10. Social relationships: mechanisms and correlates of dominance
11. Social relationships: friendships, alliances, and kin. Aggression and reconciliation
12. Social cognition: from recognition to theory of mind
13. Physical cognition: dealing with objects and events
14. Recent highlights in comparative psychology

Note: The contents of specific classes may change.

**Class requirement**
None

**Method, Point of view, and Attainment levels of Evaluation**
Assessment will be by means of two components as follows:

1) There will be a mid-term test consisting of five short-answer questions (each worth 5%) and 25 multiple-choice questions (each worth 1%) (Total: 50%).
2) There will be an end-of-course exam consisting of five short-answer questions (each worth 5%) and 25 multiple-choice questions (each worth 1%) (Total: 50%).

**Textbook**
Lecture notes/slides will be distributed and posted on KULASIS.

**Reference book, etc.**
Introduced during class

**Regarding studies out of class (preparation and review)**
No special preparations are required before or after classes, other than revising the material covered.

**Others (office hour, etc.)**
There are no specific office hours. My e-mail address is: j.r.anderson@psy.bun.kyoto-u.ac.jp

Lecture code: H722001
**Course title:** Introduction to Educational Studies I-E2  
**Affiliated department, Job title, Name:** Graduate School of Education, Professor, Emmanuel MANALO

**Group:** Humanities and Social Sciences  
**Field (Classification):** Pedagogy, Psychology and Sociology  
**Issues:**

<table>
<thead>
<tr>
<th>Language</th>
<th>Old group</th>
<th>Group</th>
<th>Number of credits</th>
<th>Course offered year/period</th>
</tr>
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<tbody>
<tr>
<td>English</td>
<td></td>
<td></td>
<td>2</td>
<td>2018 • First semester</td>
</tr>
</tbody>
</table>

**Number of weekly time blocks:** 1  
**Class style:** Lecture

<table>
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<tr>
<th>Day/period</th>
<th>Target year</th>
<th>Eligible students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon. 1</td>
<td>Mainly 1st &amp; 2nd year student</td>
<td>For all majors</td>
</tr>
</tbody>
</table>

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

The main purpose of this course is to provide students with an introduction to some of the key concepts, issues, and perspectives in the study of education. Through a series of lectures, exercises, and discussions in class, students will be encouraged to consider the meaning and functions of education; different theories of teaching and learning; differences in educational systems; strategies in catering for special educational needs and promoting inclusion; and some of the controversies and debates surrounding the issue of gender in education.

**[Course Goals]**

The goals of this course are:
- To facilitate students' acquisition of knowledge about some of the important concepts, issues, and ideas in educational studies
- To foster in students an understanding and appreciation of the multiple perspectives that exist in the study and practice of education
- To encourage students to think about the relevance and applications of the knowledge they are acquiring
- To facilitate the development of students' thinking and communication skills in English

**[Course Schedule and Contents]**

Course Schedule
The following is a guide to what will be covered during the 16 weeks of the semester. As required, some minor adjustments may be made to this schedule.

- Week 1: Introduction to the course and to the question of what education might mean
- Week 2: What education means: lecture and discussion
- Week 3: What education means: reflections about own and others' perspectives on the meaning of education
- Week 4: Theories of teaching and learning: lecture and discussion
- Week 5: Theories of teaching and learning: reflections about the usefulness of these theories to the learner
- Week 6: Theories of teaching and learning: reflections about the usefulness of these theories to the teacher
- Week 7: Differences in educational systems part 1: lecture and discussion
- Week 8: Differences in educational systems part 2: lecture and discussion
- Week 9: Differences in educational systems: reflections about culture and the realities of school settings
- Week 10: Special educational needs and inclusion: lecture and discussion
- Week 11: Educating students with learning disabilities: reflections on issues, controversies, and strategies
- Week 12: Educating students who are gifted and talented: reflections on issues, controversies, and strategies
- Week 13: Gender in education: lecture and discussion
- Week 14: Gender in education: reflections about fairness and ways to promote equal opportunities
- Week 15: Final examination
- Week 16: Feedback week

---

**Introduction to Educational Studies I-E2(2)**

**Course Conduct**

Students taking this course will be expected to prepare for each class by reading the appropriate textbook pages and any other materials that the instructor assigns. Class sessions will comprise of lectures provided by the instructor to summarize key points, highlight important issues, and introduce students to other pertinent information that bear on the topic being covered: these will all be provided on the assumption that students have undertaken the preparatory readings. The class sessions will also involve pair, small group, and/or plenary discussions, and exercises for students to complete individually or in cooperation with other students. Active participation in these discussions and exercises is necessary to meet coursework/grading requirements. 40% of the course grade is based on a portfolio of work that students complete relating to the topics dealt with in the course (i.e., exercises completed in class, notes on key points raised in discussions with other students, notes taken from and reflections on assigned and other readings undertaken, etc.).

**[Class requirement]**
None

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

Portfolio of work = 40%, Short essay (750 words) = 20%, Class discussion participation and contribution = 20%, Final examination = 20%

**[Textbook]**

Matheson, D.  
An introduction to the study of education (4rd ed.)  
(London: Routledge)  
ISBN: 415623103

**[Regarding studies out of class (preparation and review)]**
Students will be expected to spend about 90 minutes each week on out-of-class preparation, readings, and assignments.

**[Others (office hour, etc.)]**

Students will be expected to obtain their own copy of the textbook, and to read assigned chapters and other readings in preparation for each class. During the semester, students can email the instructor to make an appointment or to ask any questions about the course.

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Lecture code: H708001
Introduction to Educational Psychology I-E2

Course Conduct
Students taking this course will be expected to prepare for each class by reading the appropriate textbook pages and any other materials that the instructor assigns. Class sessions will comprise of lectures provided by the instructor to summarize key points, highlight important issues, and introduce students to other pertinent information that bear on the topic being covered: these will all be provided on the assumption that students have undertaken the preparatory readings. The class sessions will also involve pair, small group, and/or plenary discussions, and exercises for students to complete individually or in cooperation with other students. Active participation in these discussions and exercises is necessary to meet coursework/grading requirements (see below). 40% of the course grade is based on a portfolio of work that students complete relating to the topics dealt with in the course (i.e., exercises completed in class, notes on key points raised in discussions with other students, notes taken from and reflections on assigned and other readings undertaken, etc.).

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Portfolio of work = 40%, Short essay (750 words) = 20%, Class discussion participation and contribution = 20%, Final examination = 20%

[Textbook]

[Regarding studies out of class (preparation and review)]
Students will be expected to spend about 90 minutes each week on out-of-class preparation, readings, and assignments.

[Others (office hour, etc.)]
Students will be expected to obtain their own copy of the textbook, and to read assigned chapters and other readings in preparation for each class. During the semester, students can email the instructor to make an appointment or to ask any questions about the course.

Course title: Introduction to Educational Psychology I-E2
Affiliated department: Graduate School of Education
Job title: Professor
Name: Emmanuel MANALO

Group: Humanities and Social Sciences
Field (Classification): Pedagogy, Psychology and Sociology
Language: English
Old group: Group A
Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • First semester

Day/period: Mon.3
Target year: Mainly 1st & 2nd year student
Eligible students: For all majors

Outline and Purpose of the Course
The main purpose of this course is to introduce students to the basic concepts, issues, and perspectives in educational psychology and provide them with the foundational knowledge necessary for future study in this subject area. The focus of the course is on introducing essential theories and research, and considering the real and possible applications of those to educational practices.

Course Goals
The goals of this course are:
- To facilitate students' acquisition of knowledge about basic concepts, issues, and perspectives in educational psychology
- To encourage students to think about the relevance and applications of that knowledge - especially with regard to themselves and their immediate environment
- To facilitate the development of students' thinking and communication skills in English

Course Schedule and Contents

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Format of instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to the course and to the foundations of learning</td>
<td>Lecture and discussion</td>
</tr>
<tr>
<td>2</td>
<td>The brain and learning: lecture and discussion</td>
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</tr>
<tr>
<td>3</td>
<td>The psychology of learning: reflections about opportunities, limitations, and challenges</td>
<td>Lecture and discussion</td>
</tr>
<tr>
<td>4</td>
<td>The nature of development: lecture and discussion</td>
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<tr>
<td>5</td>
<td>The nature of development: reflections on the contributions of maturation and experience</td>
<td>Lecture and discussion</td>
</tr>
<tr>
<td>6</td>
<td>The nature of development: reflections on the importance of catering to individual differences in school education</td>
<td>Lecture and discussion</td>
</tr>
<tr>
<td>7</td>
<td>What &quot;learning&quot; is from the behavioural perspective: lecture and discussion</td>
<td>Lecture and discussion</td>
</tr>
<tr>
<td>8</td>
<td>What &quot;learning&quot; is from the gestalt and cognitive perspectives: lecture and discussion</td>
<td>Lecture and discussion</td>
</tr>
<tr>
<td>9</td>
<td>What &quot;learning&quot; is: reflections about the usefulness of knowing these perspectives for teachers and students</td>
<td>Lecture and discussion</td>
</tr>
<tr>
<td>10</td>
<td>The mechanisms of learning part 1: lecture and discussion</td>
<td>Lecture and discussion</td>
</tr>
<tr>
<td>11</td>
<td>The mechanisms of learning part 2: lecture and discussion</td>
<td>Lecture and discussion</td>
</tr>
<tr>
<td>12</td>
<td>The mechanisms of learning: reflections about applications of principles to classroom teaching and learning</td>
<td>Lecture and discussion</td>
</tr>
<tr>
<td>13</td>
<td>Language and learning: lecture and discussion</td>
<td>Lecture and discussion</td>
</tr>
<tr>
<td>14</td>
<td>Language and learning: reflections about the relationship between language and thought</td>
<td>Lecture and discussion</td>
</tr>
<tr>
<td>15</td>
<td>Final examination</td>
<td></td>
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<tr>
<td>16</td>
<td>Feedback week</td>
<td></td>
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</tbody>
</table>

Lecture code: H709001
This course complements Pedagogy I. It provides students an opportunity to deepen their understanding of ideas discussed in by reading academic articles and other related materials on these subjects. Through these readings, the major concepts and ideas in Pedagogy I can be grasped more easily and students will have more time to debate and develop their ideas.

One primary goal of this Advanced Lecture is to give students confidence to read academic materials in English. Another goal is to develop more rigorous analytical skills, including the ability to compare, contrast, critique, and construct perspectives related to education. A third goal is to gain a deeper knowledge of the various components of education: schools, goals, teachers, curriculum, etc. In contrast to Pedagogy I, the core of this class will focus on critical reading and analysis of original texts.

Introduction (1 class)

Part I: What do good schools look like? (4-5 classes) - This section will examine various examples of innovative schools drawn from different cultural contexts, including Summerhill, monasteries, and preschools in Japan and America.

Part II: What is the goal of education? (3-4 classes) - This section will introduce students to 3 broad aims for schooling found throughout the world: economic growth, social equality, and individual development.

Part III: What makes a good teacher? (3-4 classes) - We next turn to look at the different styles of teacher that match the different goals of education discussed in Part II.

Part IV: What should be taught? (2-3 classes) - This section focuses on what is taught, both the explicit and hidden curriculum of schools.

Part V: What will schools look like in the future? (2-3 classes) - Drawing together all the previous sections of the course, we contemplate the future of education, in particular technology and globalization.

(15 classes total, 1 Final Exam, 1 Feedback Section)

There are no special requirements for taking this course. However, students are strongly encouraged to also enrol in Pedagogy I at the same time as this course (Pedagogy I will be held just before this class). These two courses will be roughly the same content, but Advanced Lecture for Pedagogy I will focus more on reading skills, deepening analysis, and contemplation. All lectures will be in English, but the instructor can read and understand Japanese, so questions or comments may occasionally be made in Japanese.

Lecture code: H715001
Introduction to Ritual Studies-E2

[Class requirement]
There are no specific requirements for taking this seminar. However, students must be willing to prepare each session by completing the weekly readings and assigned tasks, and to participate actively in class.

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on class attendance and active participation (60%), a group works and presentations (20%) and final project (20%).

Active participation means actively listening and engaging with the class content, participating during discussions and group work, and contributing to the class by sharing opinions, experiences and reflections. Students absent 3 times or more will fail this class.

Tardiness of 15 minutes or more will be treated as absence. Systematic tardiness and leaving the class early will also result in a decrease of the final grade.

[Textbook]
There is no textbook for this seminar. Weekly readings will be available for download. Printing and preparing the material is the responsibility of the student.

[Reference book, etc.]
Introduced during class

[Regarding studies out of class (preparation and review)]
Students are required to prepare for each class by completing the weekly readings and assigned tasks and should expect to spend 2 to 3 hours weekly reviewing and preparing for class.

[Others (office hour, etc.)]
- This is a lecture-type class with an interactive component. It will be conducted in English. All readings will also be in English.
- The capacity of the class will be limited to 25 students to ensure the interactive aspect of it.
- As stated in the evaluation section, students are expected to engage actively during class.
- Office hour is after class or by appointment.

Lecture code: H734001
## Course title<br>Introduction to Sociological Observation-E2

### Affiliated department, Job title, Name<br>Graduate School of Global Environmental Studies, Associate Professor, SINGER JANE

<table>
<thead>
<tr>
<th>Group</th>
<th>Humanities and Social Sciences</th>
</tr>
</thead>
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<tr>
<td>Field (Classification)</td>
<td>Pedagogy, Psychology and Sociology</td>
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<td>Language</td>
<td>English</td>
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<td>Number of weekly time blocks</td>
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<td>Class style</td>
<td>Lecture</td>
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<tr>
<td>Course offered year/period</td>
<td>2018 • First semester</td>
</tr>
<tr>
<td>Day/period</td>
<td>Fri. 4</td>
</tr>
<tr>
<td>Target year</td>
<td>Mainly 1st &amp; 2nd year students</td>
</tr>
<tr>
<td>Eligible students</td>
<td>For all majors</td>
</tr>
</tbody>
</table>

### [Outline and Purpose of the Course]

Why do you wish to buy brand-name goods? Why do you select a particular friend or spouse? Sociology is the study of human social life, groups, and societies. Study in this field helps us understand why we act the way we do, how historical and social factors affect us and how we can address social and societal problems. In this course students will apply sociological approaches to examine aspects of our own and other societies that interest them. Through videos, lectures, group and pair discussions and extensive class interaction we will explore these topics in a cross-cultural and dynamic classroom setting.

### [Course Goals]

Students will understand and be able to apply some core sociological theories, including Marxism, social functionalism and symbolic interaction, to question critically the causes, meanings and implications of social trends and phenomena. They will improve presentation skills and learn how to conduct observation-based qualitative research.

### [Course Schedule and Contents]

- **Class 1:** What is sociology? Introduction to the field
- **Class 2:** Theories and their application: Sociological observation
- **Class 3-4:** Marriage and the family (lecture and group activities)
- **Class 5-6:** Child-rearing and socialization
- **Class 7-8:** Midterm test. Culture and norms. Start student presentations
- **Class 9-10:** Gender and roles, student presentations
- **Class 11-12:** Racism and ethnicity, student presentations
- **Class 13-14:** Deviance and poverty, student presentations

Note: The schedule may change slightly depending on class requirements.

### [Class requirement]

None

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

Evaluation will be based on class attendance and active participation (30%), short assignments and classroom exercises (30%), a mid-term test (15%) and final group or individual presentations (25%).

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Lecture code: H712001
Course title: Introduction to Globalization Studies-E2

Affiliated department, Job title, Name: Graduate School of Letters, Associate Professor, Stephane Heim

Group: Humanities and Social Sciences

Field(Classification): Pedagogy, Psychology and Sociology(Issues)

Language: English

Old group: Group A

Number of weekly time blocks: 1

Class style: Lecture

Course offered year/period: 2018 • First semester

Day/period: Tue. 4

Target year: Mainly 1st year students

Eligible students: For all majors

Outline and Purpose of the Course
Globalization is presented as the main factor of evolution affecting the contemporary world, both in its political, economic, social, and cultural dimensions. Globalization has then to be examined as a process that entails several changes due to migration, political regional integration, unequal economic development, cultural convergence for example. This course focuses on these overall tendencies, and their various effects on developing and developed countries.

Course Goals
The first target of this course is to provide students with sound knowledge about the several ways globalization impact our societies. In that respect, students will study both the economic, political, social, and cultural dimensions of globalization. At the end of the course, they will have an interdisciplinary and problem-oriented approach of issues entailed by globalization.

Course Schedule and Contents
Week 1. Course Introduction
Week 2. Theories of the Global System, Discourses on Globalization
Week 3. Sociology of Globalization
Week 4. Globalization in a Historical Perspective
Week 5. Economic Globalization: Global Capitalism
Week 6. Economic Globalization: Neoliberalism
Week 7. Political Globalization: Transnational State and Institutions
Week 8. Political Globalization: Global Democratization
Week 9. Cultural Globalization: Local/Global
Week 10. Globalization, Ethnicity, and Gender
Week 11. Globalization, Identity, Culture, and Communication
Week 12. Globalization, and Transnational Migrations
Week 13. Globalization and Environment
Week 14. Course Conclusions
Week 15. Feedback

Class requirement
The lectures will be delivered in English. There are no prerequisite to take this course.

Method, Point of view, and Attainment levels of Evaluation
Ordinarily, 70% final exam.
Introduction to Primate Behavior and Cognition-E2

This class will focus on nonhuman primates (prosimians, monkeys, apes) and why they are of particular interest to many biologists, anthropologists, and psychologists. Students will learn about taxonomic relationships and distribution of primates, their socio-ecological strategies, social systems, and cognitive abilities. Observational and experimental investigations of these and related phenomena will be reviewed and analyzed. The aim is to investigate the ecological and psychological status of primates in today's world. The course also aims to provide students with the opportunity to communicate about primates in English.

Course Goals
The class aims to help students acquire knowledge about the evolution of primates - their structure, their social and nonsocial behavior, and how they adapt to changing environmental circumstances, and to use written and spoken English to express their knowledge.

Course Schedule and Contents
1. Why study primate behavior? Brief introduction to Primates, and methods of study
2. Primate taxonomy
3. Early influential studies of primate behavior
4. Primate socio-ecology: social organizations and environment
5. Primate socio-ecology: specific adaptations and strategies; responses to habitat change
6. Living together: sympathy, intra- and inter-group competition and cooperation in the wild
7. Living together: experimental approaches to studying competition and cooperation
8. Behavioral adaptations: how genes and experience interact
9. Mechanisms and parameters of social learning
10. Tool use as a foraging adaptation
11. Primate intelligence: evolutionary factors
12. Primates in captivity: the good and the bad
13. Ethical aspects of research on nonhuman primates
14. Recent highlights in the study of primate behavior

Class requirement
None

Method, Point of view, and Attainment levels of Evaluation
Assessment will be based on two components as follows:
1) A mid-term test consisting of 25 multiple-choice questions (each worth 1%) and five short-answer questions written in the students' own words (each worth 5%) (Total: 50%)
2) A final exam consisting of 25 multiple-choice questions (each worth 1%) and five short-answer questions written in the students' own words (each worth 5%) (Total: 50%)

Textbook
Lecture notes/slides will be distributed.

Reference book, etc.
Introduced during class

Regarding studies out of class (preparation and review)
Students are expected to review the lecture handouts after each class, and to consult other sources (books, journals, appropriate websites).

Others (office hour, etc.)
There are no specific office hours. My e-mail address is: j.r.anderson@psy.bun.kyoto-u.ac.jp

Lecture code: H723001
Introduction to Educational Psychology II-E2

The main purpose of this course is to introduce some key concepts, issues, and perspectives in educational psychology and provide students with the foundational knowledge necessary for future study in this subject area. The focus of the course is on introducing essential theories and research, and considering the real and possible applications of those to educational practices.

Course Goals

Following on from Introduction to Educational Psychology I, the goals of this course are:
- To facilitate students' acquisition of more knowledge about basic concepts, issues, and perspectives in educational psychology
- To encourage students to think about the relevance and applications of that knowledge - with regard to themselves, their immediate environment, and beyond
- To facilitate the development of students' thinking and communication skills in English

Course Schedule and Contents

Course Schedule
The following is a guide to what will be covered during the 16 weeks of the semester. As required, some minor adjustments may be made to this schedule.

Week 1: Introduction to the course and to concept formation in children
Week 2: Schema in learning: lecture and discussion
Week 3: Concepts and schemas: reflections about what we know, how we know, what we think others may know ...
Week 4: Memory: an introduction to and discussion of basic concepts
Week 5: Remembering and forgetting: reflections about what we retain and what we lose in memory
Week 6: Mnemonic techniques: reflections about uses in educational settings
Week 7: Learning in school: lecture and discussion
Week 8: Learning in school: reflections about what is taught - and how
Week 9: Examinations and tests: lecture and discussion
Week 10: Formative and summative evaluation: reflections about effects on learning
Week 11: Test and question types: reflections about uses and usefulness
Week 12: Intelligence and intelligence testing: lecture and discussion
Week 13: Ability grouping: reflections about advantages and disadvantages for students and teachers
Week 14: Diversity in education: reflections about benefits and challenges
Week 15: Final examination
Week 16: Feedback week

Course Conduct

Students taking this course will be expected to prepare for each class by reading the appropriate textbook pages and any other materials that the instructor assigns. Class sessions will comprise of lectures provided by the instructor to summarize key points, highlight important issues, and introduce students to other pertinent information that bear on the topic being covered: these will all be provided on the assumption that students have undertaken the preparatory readings. The class sessions will also involve pair, small group, and/or plenary discussions, and exercises for students to complete individually or in cooperation with other students. Active participation in these discussions and exercises is necessary to meet coursework/grading requirements (see below). 40% of the course grade is based on a portfolio of work that students complete relating to the topics dealt with in the course (i.e., exercises completed in class, notes on key points raised in discussions with other students, notes taken from and reflections on assigned and other readings undertaken, etc.).

Course Requirement
There are no prerequisites, but it is preferable if students have taken Introduction to Educational Psychology I before taking this course.

Method, Point of view, and Attainment levels of Evaluation
Portfolio of work = 40%, Short essay (750 words) = 20%, Class discussion participation and contribution = 20%, Final examination = 20%

Textbook

Regarding studies out of class (preparation and review)
Students will be expected to spend about 90 minutes each week on out-of-class preparation, readings, and assignments.

Others (office hour, etc.)
Students will be expected to obtain their own copy of the textbook, and to read assigned chapters and other readings in preparation for each class. During the semester, students can email the instructor to make an appointment or to ask any questions about the course.

Lecture code: H710001
### Course title
Introduction to Educational Studies II-E2

### Affiliated department, Job title, Name
Graduate School of Education Professor Emmanuel MANALO

### Group
Humanities and Social Sciences

### Field(Classification)
Pedagogy, Psychology and Sociology

### Language
English

### Old group
Group A

### Number of weekly time blocks
1

### Class style
Lecture

### Course offered year/period
2018 \* Second semester

### Eligible students
For all majors

### Day/period
Mon. 1

### Target year
Mainly 1st & 2nd year student

### Target year
Mainly 1st & 2nd year student

### Number of credits
2

### Course offered year/period
2018 \* Second semester

### Course Schedule and Contents

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<tr>
<th>Course Schedule</th>
<th>Contents</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Introduction to the course and to the role of technology in education</td>
</tr>
<tr>
<td>Week 2</td>
<td>The “flipped” classroom: reconsidering teacher and student roles</td>
</tr>
<tr>
<td>Week 3</td>
<td>Early childhood education: lecture and discussion</td>
</tr>
<tr>
<td>Week 4</td>
<td>Compulsory school education: lecture and discussion</td>
</tr>
<tr>
<td>Week 5</td>
<td>Further and higher education: lecture and discussion</td>
</tr>
<tr>
<td>Week 6</td>
<td>Discussion of student project on investigating and comparing educational provisions in Japan, part 1</td>
</tr>
<tr>
<td>Week 7</td>
<td>Discussion of student project on investigating and comparing educational provisions in Japan, part 2</td>
</tr>
<tr>
<td>Week 8</td>
<td>Motivation and school achievement: lecture and discussion</td>
</tr>
<tr>
<td>Week 9</td>
<td>Lifelong learning: lecture and discussion</td>
</tr>
<tr>
<td>Week 10</td>
<td>Lifelong learning: reflections on its value</td>
</tr>
<tr>
<td>Week 11</td>
<td>Race and social class inequalities in education: lecture and discussion</td>
</tr>
<tr>
<td>Week 12</td>
<td>Inequalities in education: reflections about the effectiveness of strategies for addressing inequalities</td>
</tr>
<tr>
<td>Week 13</td>
<td>Educational research: lecture and discussion</td>
</tr>
<tr>
<td>Week 14</td>
<td>Educational research: some considerations about what, why, and how</td>
</tr>
<tr>
<td>Week 15</td>
<td>Final examination</td>
</tr>
<tr>
<td>Week 16</td>
<td>Feedback week</td>
</tr>
</tbody>
</table>

### Outline and Purpose of the Course

The main purpose of this course is to introduce some key concepts, issues, and perspectives in the study of education. Through a series of lectures, exercises, and discussions in class, students will be encouraged to consider various important issues about student and teacher roles, and what happens in the classroom and beyond. Through a project, students will investigate and reflect on educational provisions in Japan in comparison to the United Kingdom (covered in the textbook) and other countries.

### Course Goals

Following on from Introduction to Educational Studies I, the goals of this course are:
- To further facilitate students’ acquisition of knowledge about some of the important concepts, issues, and ideas in educational studies
- To continue to foster in students an understanding and appreciation of the multiple perspectives that exist in the study and practice of education
- To encourage students to think about the relevance and applications of the knowledge they are acquiring
- To facilitate the development of students’ thinking and communication skills in English

### Class requirement

There are no prerequisites, but it is preferable if students have taken Introduction to Educational Studies I before taking this course.

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

Portfolio of work = 40%, Report (750 words) = 20%, Class discussion participation and contribution = 20%, Final examination = 20%

### Textbook


### Regarding studies out of class (preparation and review)

Students will be expected to spend about 90 minutes each week on out-of-class preparation, readings, and assignments.

### Others (office hour, etc.)

Students will be expected to obtain their own copy of the textbook, and to read assigned chapters and other readings in preparation for each class. During the semester, students can email the instructor to make an appointment or to ask any questions about the course.
### Advanced Lecture for Pedagogy II-E2(2)

**Outline and Purpose of the Course**

This course complements and extends Pedagogy II. It focuses on deepening students understanding of major pedagogical approaches by critically engaging with original, high-level texts by leading philosophical and educational thinkers. Students are encouraged to read advanced level texts so that they can acquire both a higher command of academic English and a deeper understanding of diverse pedagogical approaches.

**Course Goals**

One primary goal of this course are to help students gain the skills and confidence to read challenging academic materials in English. Another goal is to develop high-level analytical skills in the field of pedagogy. A third is to gain a deeper knowledge of leading thinkers. In contrast to Pedagogy II, the core of this class will be critical reading and analysis of original texts. The modes of critical engagement acquired will be useful across all subjects in the social sciences and humanities.

**Course Schedule and Contents**

This class will complement and thus closely follow Pedagogy II. Ideally, all students will enrol in both courses, first receiving lectures in Pedagogy II, then reading original texts to deepen their knowledge further in the Advanced Lecture for Pedagogy II.

As such, the class is organized in the same manner as Pedagogy II:

1. Class Overview and Student Questionarie (1 class)
2. Classic Conceptions: Plato's Cave, Socrates Soul (1-2 classes)
3. Traditional Pedagogy (Christianity, Oakeshott) (1-2 classes)
4. Progressive Pedagogy (Rousseau, Kilpatrick) (2-3 classes)
5. Dewey's Pedagogy: Experience, and Democracy (2-3 classes)
6. Eastern Pedagogy: Confucius, Sun Yatsen (2 classes)
7. Non-Western Pedagogy? Self, Tradition, Other (Japanese thinkers and others) (2-3 classes)
8. Critical Pedagogy (Freire) (2-3 classes)
9. Non-Western Pedagogy? Self, Tradition, Other (Japanese thinkers and others) (2-3 classes)

15 lectures total, including Final Examination (or Final Paper), plus 1 Feedback Class

---

**Class requirement**

There are no special requirements for taking this course. However, students are strongly encouraged to also enroll in Pedagogy II at the same time as this course. These two courses will be roughly the same content, but Advanced Lecture for Pedagogy II will focus more on reading skills and deepening knowledge. All lectures will be in English, but the instructor can read and understand Japanese, so questions or comments may occasionally be made in Japanese.

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

Classes will take the form of group analysis of key texts. Students will be expected to deliver a 10-15 minute presentation at least once during the course. Grading will be based on attendance and active participation (30 points), evidence of advanced preparation (15 points), presentation and reflection paper (15 points), and a final evaluation, test or paper to be decided later (40 points). Students who are absent more than four times will not be given credit.

**Textbook**

Not used

There is no textbook for this course. All readings will be distributed by the instructor in PDF format and hard copy (if students wish to have hard copy). We will discuss in the first class.

**Reference book, etc.**

J. Palmer (Ed.) 『Fifty Major Thinkers on Education: From Confucius to Dewey』（* Available online）

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

Students are expected to read 1-2 major articles outside of class each week. This will be roughly 15-30 pages of challenging, academic English language text. This will require studying 2-3 hours outside of class each week for this course.

**Others (office hour, etc.)**

Office Hours will be held 1 hour each week (time and place to be announced)
This course proposes to explore disaster through the filter of culture and how disasters and culture relate from an anthropological perspective. It explores how disasters emerge from the combination of natural and socio-cultural forces and how humans conceive and deal with disasters. Posing disasters as multidimensional socio-cultural processes, we will focus on how humans perceive and conceive, interpret and represent disasters outside the realm of "hard science", from a socio-cultural angle. We will address issues such as the perception and interpretation of disaster, vulnerability and resilience, cultural competence in disaster context, as well as the cultural expressions of disaster phenomena, how culture shapes our perceptions, interpretations, and on the reverse, how disaster can also shape culture.

**Course Goals**

There are 3 main objectives for this class. First, students will gain an understanding of the notion of culture and how it plays out in disaster contexts, and opportunities to reflect on various cultural expressions and interpretations of disasters. Second, they will acquire a working command of concepts such as culture, risk, vulnerability, resilience, and social capital and a sense of what a socio-cultural anthropological approach is. Third, it will encourage students to think from a variety of perspectives and become more comfortable formulating thoughts and opinions on a specific topic.

**Course Schedule and Contents**

This is a lecture-type class with an interactive component. Each session will include a lecture part and followed or interspersed by discussion based on the lecture content and this week's readings.

1- Orientation and overview
2- Culture and disaster (P. 1)
3- Culture and disaster (P. 2)
4- The perception of risk
5- Group discussion
6- Vulnerabilities and resilience
7- Cultural interpretations - the folklore of disaster
8- Cultural representations of disaster
9- Religion and disaster
10- Group discussion
11- Social networks in disaster contexts
12- Cultural competence in disaster
13- Cultural heritage and disaster
14- Final presentation or group work

**Class requirement**

There are no specific requirements for taking this seminar. However, students must be willing to prepare each session by completing the weekly readings and assigned tasks, and to participate actively in class.

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

Evaluation will be based on class attendance and active participation (60%), a mid-term group work or presentation (20%) and final group or individual presentations (20%).

Active participation means actively listening and engaging with the class content, participating during discussions and group work, and contributing to the class by sharing opinions, experiences and reflections. It also means taking notes and reviewing them each week, since each class will start with a quick recap of the previous week done by a student.

Students absent 3 times or more will fail this class. Tardiness (by 15 minutes or more) will be treated as absence. Systematic tardiness and/or unexplained early departures will greatly reduce your attendance and participation grade.

**Textbook**

There is no textbook for this class. Weekly readings and documents will be available for download. Printing and preparing the material is the responsibility of the student.

**Reference book, etc.**

Introduced during class

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

Students are required to prepare for each class by completing the weekly readings and assigned tasks. They should expect 2 to 3 hours/week of work outside the classroom for review and preparation.

**Others (office hour, etc.)**

- This is a lecture-type class with an interactive component. It will be conducted in English. All readings will also be in English.
- The capacity of the class will be limited to 25 students to ensure the interactive aspect of it.
- As stated in the evaluation section, students are expected to engage actively during class.
- Office hour is after class or by appointment.
Course title: Introduction to Society and Community Studies-E2

Affiliated department, Job title, Name: Disaster Prevention Research Institute, Associate Professor, SAMADDAR, Subhajyoti

Group: Humanities and Social Sciences
Field(Classification): Pedagogy, Psychology and Sociology(Issues)

Language: English
Old group: Group A
Number of credits: 2

Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • Second semester

Day/period: Wed.2
Target year: Mainly 1st & 2nd year students
Eligible students: For all majors

[Outline and Purpose of the Course]
This course offers an introduction to the basic nature of society and community and their impact on individual mind and self. This course focuses on how society and community impact and influence individual motivation, attitude, perception and actions. Further, the focus will be placed on community participation in order to understand how decisions are collectively made in society and what are the factors that influence the various decision making process.

[Course Goals]
To understand conceptual and theoretical understanding of the society, community and culture and their role shaping individual attitude, perceptions and actions.
To understand the nature of social groups, organizations, social intuitions and their importance for individuals and society.
To understand how decisions are made in a society, who make and influence the decision making process and how. Further the focus will be placed on how all sections and individuals of a society and community can be involved in the collective decision making process.

[Course Schedule and Contents]
1. An Introduction to society, community and Culture (Week 1 to 3)
2. Socialization - - Theories of Self Development; Why Socialization Matters; - Agents of Socialization. (Week 4 to 5)
3. Individual and collective decision making process in society and community. (Week 6 to 9)
4. Community, sense of community and collective action and community participation. (Week 10 to 12)
5. Groups and organization and their role in collective decision making process (Week 13 and 14)
6. Exam (Week 15)

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Assignment 2 (30 points each)
Exam -1 ( 40 points)

[Textbook]
Handouts will be distributed by the instructor if necessary.

[Regarding studies out of class (preparation and review)]
- prepare and review class contents, reading textbooks.
- complete short assignments .

[Lecture code: H718001]
<table>
<thead>
<tr>
<th>Course title</th>
<th>Introduction to Risk Communication-E2</th>
<th>Affiliated department, job title, name</th>
<th>Disaster Prevention Research Institute, associate professor, SAMADDAR, Subhajyoti</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
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<td>Field (Classification)</td>
<td>Pedagogy, Psychology and Sociology (Issues)</td>
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<tr>
<td>Language</td>
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<td>Group A</td>
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<tr>
<td>Number of weekly time blocks</td>
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<td>Class style</td>
<td>Lecture</td>
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<tr>
<td>Day/period</td>
<td>Wed. 3</td>
<td>Target year</td>
<td>Nearly 1st &amp; 2nd year students</td>
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<tr>
<td>Eligible students</td>
<td>For all majors</td>
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</table>

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

Modern society is characterized as risk society, particularly populations and communities vulnerable to natural hazards and environmental risk are increasing day by day. Effective risk communication is critical for increasing risk awareness and encouraging preparedness among the community members. However, the risk managers, city government authorities, environmental risk regulators are often challenged by how to better communicate with the masses because risk itself and how it is communicated is socially and culturally dependent. The purpose of this course is to explain how planners and practitioners can design and implement communication plans related to environmental and disaster risks.

**[Course Goals]**

The goal of this course are: (i) To introduce basic knowledge on risk communication in disaster and environmental risk context. (ii) To introduce the theory and best practices in risk communication (iii) To bring understanding on effective risk communication principles and strategies for enhancing disaster and environmental risk preparedness (iv) To gain knowledge on risk communication strategies from some best.

**[Course Schedule and Contents]**

1. What is Risk and why to study risk? (Week 1)
2. How society shapes risk perception and awareness (Week 2)
3. The need for risk communication (Week 3)
4. Factors affecting risk communication (Week 4 - 5)
5. Risk communication channels and tools (Week 6)
6. Psychological Approaches of Risk Communication (Week 7 - 8)
7. Social Perspective of Risk Communication (Week 9 - 10)
8. Strategies for effective risk communication (Week 11)
9. Some case-studies of risk communication (Week 12 - 13)
10. Introduction to some successful practices of risk communication (Week 14)

**[Class requirement]**

None

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

Assignment 1 (40 points)
Mid-term class exam (30 points)
Final exam (30 points)

**[Textbook]**

Handouts will be distributed by the instructor if necessary.

**[Reference book, etc.]**

Risk Communication: A Handbook for Communicating Environmental, Safety, and Health Risks
Regina E. Lundgren, Andrea H. McMakin

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

- Prepare and review class contents, reading textbooks.
- Complete short assignments on a regular basis.

**[Others (office hour, etc.)]**

Students who want to talk to the instructor must make arrangements in advance by email.

Lecture code: H717001
[Outline and Purpose of the Course]

Work and organizations are two central institutions in contemporary societies, greatly participating in their shaping through social stratification and social integration. They create differentiation among individuals in terms of occupations, but they also give birth to interdependency and modes of cooperation through which individuals interact with each other. Based on these two processes (social differentiation and integration), the course will put the emphasis on different aspects of work and organizations while presenting the main theories in this field of research.

[Course Goals]

The course aims at understanding the basics of sociology of work and organizations, so that students develop a critical sense about the functioning of these two institutions, and are prepared to solve problems they might encounter in their future careers. Students will therefore acquire knowledge of several approaches and theories on the function of work and organizations in the society. Several case studies will also be introduced to illustrate these approaches.

[Course Schedule and Contents]

Week 1. Course Introduction: What is Sociology of Work and Organizations?
Week 2. Theories of Work: Division of Labor
Week 3. Theories of Organization: Bureaucracy and Control
Week 4. Taylorism, Rationality, and the Labor Society
Week 5. Fordism, Post-Fordism, and Neoliberalism
Week 6. The Social Construction of Markets
Week 7. Firms: Outsourcing, Control, and Trust
Week 8. The Emergence of the Service Industry
Week 9. From Qualification to Competencies: Wages and Industrial Relations
Week 10. Professions and Occupational Groups
Week 11. Employment and Unemployment
Week 12. Work, Age, Gender, and Family
Week 13. Work, Organizations, and Institutions
Week 14. Course Conclusions
Week 15 Feedback

[Class requirement]

The lectures will be delivered in English. There are no prerequisite to take this course, though it would be better to have some basic sociological knowledge.
### Course title
Introduction to Social Research-E2

### Affiliated department, Job title, Name
Graduate School of Letters, Associate Professor, Stephane Heim

### Group
Humanities and Social Sciences

### Field (Classification)
Pedagogy, Psychology and Sociology (Issues)

### Language
English

### Old group
Group A

### Number of credits
2

### Number of weekly time blocks
1

### Class style
Lecture

### Course offered year/period
2018 • Second semester

### Day/period
Tue. 3

### Target year
Mainly 1st & 2nd year students

### Eligible students
For all majors

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### Outline and Purpose of the Course
Social sciences, whose aim is an in-depth understanding of human behaviors, share with natural and engineering sciences a common "scientific frame", while having also specific and diverse research methodologies. Those methodologies are usually divided into quantitative and qualitative approaches. The qualitative approaches are presented in this lecture. We will see both how a research can be conducted from the building of a sound problematic to the final report writing, and how several well-known surveys produced knowledge about human behaviors.

### Course Goals
This course aims to familiarize students with different qualitative research methods so as to develop their critical sense and ability in analyzing social, economic, and political issues presented and debated in the media, and in leading qualitative researches on their own. A great variety of researches will be exposed and discussed, as well as the construction of, and issues linked with each step of a qualitative research.

### Course Schedule and Contents

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction to Field Research</td>
</tr>
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<td>2</td>
<td>Literature Reviews</td>
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<tr>
<td>3</td>
<td>Research Design: Hypothesis and Research Question</td>
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<tr>
<td>4</td>
<td>Field Research and Questionnaire</td>
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<td>5</td>
<td>Interviews, Observation, and Participation</td>
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<td>6</td>
<td>Documents and Archives</td>
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<td>7</td>
<td>Interpretation, Qualitative Data Analysis, and Content Analysis</td>
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<td>8</td>
<td>Conceptualization, Operationalization</td>
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<td>9</td>
<td>Writing Research Reports</td>
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<td>10</td>
<td>Historical/Comparative Research</td>
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<td>11</td>
<td>Field Research and Social Surveys</td>
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<td>12</td>
<td>Social Research in Critical Perspective</td>
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<td>13</td>
<td>Research Ethics</td>
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<tr>
<td>14</td>
<td>Course Conclusions</td>
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<td>15</td>
<td>Feedback</td>
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</tbody>
</table>

### Class requirement
The lectures will be delivered in English. There are no prerequisite to take this course.

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### Method, Point of view, and Attainment levels of Evaluation
Ordinarily, 70% final exam.

### Textbook
Instructed during class

### Reference book, etc.
(Reference book)
Introduced during class

### Regarding studies out of class (preparation and review)
During each class, the first ten-fifteen minutes are dedicated to the review of the previous class. Students are asked to prepare each lesson on a weekly basis.

### Others (office hour, etc.)
Students should email the teacher to make an appointment.

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Lecture code: H725001
Human Geography-E2

[Reference book, etc.]
Introduced during class

[Regarding studies outside the class (preparation and review)]
Students are expected to prepare for each class and be ready to discuss the week's topics in small groups. Preparatory materials include academic readings, news pieces and online media materials.

[Others (office hours, etc.)]
Please email the instructor.

[Outline and Purpose of the Course]
The course investigates the spatial organisation of human action and the relationships between society and environment and offers a critical exploration of the interactions between people, place and space through the core themes of globalisation, development, urbanisation, diversity and inequality. The course explores the ways in which both local and global forces continuously shape socio-cultural and economic landscapes.

[Course Goals]
The course equips students with basic concepts in human geography required to understand, interpret and synthesise information on the world around us. Students develop the ability to use geography and spatial perspectives to think creatively and critically about human interactions with the environment.

[Course Schedule and Contents]
Week 1: What is Human Geography? A Brief Overview
Week 2: Past Worlds and the Rise of Capitalism
Week 3: Populations and Demographic Change
Week 4: Resources, Development, and the Environment
Week 5: Global Differences and Inequality
Week 6: Urban and Rural Geographies
Week 7: Social Construction of Nature
Week 8: Culture and Global Change
Week 9: Geographies of the Economy
Week 10: Global Production and Exchange of Labour
Week 11: Geographies of Consumption
Week 12: Money, Space, and Power
Week 13: Territory, Space, and Geopolitics
Week 14: Course Review

[Class requirement]
You are curious to explore the value of human geography in understanding the world around you.

[Method, Point of view, and Attainment levels of Evaluation]
40% Attendance and in-class discussion and participation, 20% Research Summary (500-800 words), 40% Essay (1500 words)

[Textbook]
Required readings and materials will be distributed in class.
<table>
<thead>
<tr>
<th>Course title: Human Geography-E2</th>
<th>Affiliated department, Job title, Name: Center for Southeast Asian Studies, Associate Professor, BADENOCH, Nathan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
<td><strong>Language</strong></td>
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<tr>
<td>Humanities and Social Sciences</td>
<td>English</td>
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<tr>
<td><strong>Field (Classification)</strong></td>
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<tr>
<td>Regions and Cultures (Foundations)</td>
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<td><strong>Old group</strong></td>
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<td><strong>Eligible students</strong></td>
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<td>For all majors</td>
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</table>

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

Human Geography is the study of how human systems are distributed spatially across the globe, how they interact with their natural environment and how people move and communicate within them. We are in an age of globalization, but we must pay attention to regionalization and localization, as well, as people, resources, money, power, words and ideas move around the world in a multitude of ways. Some have argued that geography is dead, but in this course we will explore the question from two angles: how geography influences human actions, and how society has continuously adapted to accommodate geographic constraints. We will examine not only the spatial elements of these global issues, but also the constant interplay between the local, national, regional and global.

**[Course Goals]**

The goal of this course is to familiarize ourselves with the basic concepts of Human Geography in the context of globalization. By the end of the course, we will have developed analytical skills and nuanced perspectives for examining the global issues that affect us locally.

**[Course Schedule and Contents]**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction: What is human about geography?</td>
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<tr>
<td>2</td>
<td>Population: The spatial dynamics of human diversity</td>
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<tr>
<td>3</td>
<td>Globalization: Is geography irrelevant in our world?</td>
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<tr>
<td>4</td>
<td>Researching Human Geography: Individual papers</td>
</tr>
<tr>
<td>5</td>
<td>Borders: Built to separate or to connect?</td>
</tr>
<tr>
<td>6</td>
<td>Urbanization: The future of human settlement is here</td>
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<tr>
<td>7</td>
<td>Migration: Ways of leaving home</td>
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<tr>
<td>8</td>
<td>Regionalization: Are regions the new nation states?</td>
</tr>
<tr>
<td>9</td>
<td>Communication: The Internet, English and the Movement of Ideas</td>
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<tr>
<td>10</td>
<td>Environment and Development: Is sustainability a dream?</td>
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<td>11</td>
<td>Conflict and mobility: Refugees in the global age</td>
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<tr>
<td>12</td>
<td>Health: Disease on the move, Care on the move</td>
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<tr>
<td>13</td>
<td>Pluralistic society: Has multiculturalism failed?</td>
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<tr>
<td>14</td>
<td>Review discussion: Human Geography into the future</td>
</tr>
</tbody>
</table>

**[Class requirement]**

None

**Human Geography-E2(2)**

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

Students will be evaluated on attendance and class participation (40%), submission of weekly reflection writings (20%) and an individual research paper (40%).

**[Textbook]**

Not used

**[Reference book, etc.]**

- [Reference book]

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

Students will be expected to prepare for each class and be ready to discuss the weeks topics in a group. Preparatory materials will include readings and others such as podcasts and short documentaries.

**[Others (office hour, etc.)]**

Office hours can be arranged as necessary.
**Course title**
Cultural Anthropology I-E2

**Affiliated department, Job title, Name**
Center for Southeast Asian Studies, Associate Professor, LOPEZ, Mario Ivan

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<td>Day/period</td>
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<tr>
<td>Target year</td>
<td>Mainly 1st &amp; 2nd year student</td>
</tr>
<tr>
<td>Eligible students</td>
<td>For all majors</td>
</tr>
</tbody>
</table>

**Outline and Purpose of the Course**
Anthropology is the comparative study of culture and human societies and examines the general principles of social and cultural life. This course offers an introduction to the discipline of anthropology and its practical relevance to understanding societies. It introduces the different ways we can examine human societies and understand exchange processes, kinship and family, marriage, culture, nature, gender, nation building, and religion and ritual. Each week will consist of a brief lecture of 30~40 minutes based on class notes and readings followed by a class discussion and group exercises.

**Course Goals**
The main purpose of the course is to give students a critical introduction and understanding to cultural diversity and processes of change within and between societies. The course provides students with some basic tools that can help students to recognize the preconceptions and assumptions of their own social and cultural environments. This course is open to anyone who is interested in societies and cultures, and willing to proactively participate in discussions over the duration of the course.

**Course Schedule and Contents**

- Week 1. Overview
- Week 2. Social Theory, Culture and Cultural Relativity
- Week 3. Kinship and Family
- Week 4. Marriage
- Week 5. The Sharing Economy
- Week 6. Human Societies and Nature (1)
- Week 7. Human Societies and Nature (2)
- Week 8. Gender (1)
- Week 9. Gender (2)
- Week 10 Identifying “Others”
- Week 11. Community Building
- Week 12. Nation Building and Nationalism
- Week 13. Religion and Ritual
- Week 14. The Secular and Anthropology
- Week 15. Recap

**Class requirement**
Students should be able to participate in discussions, do readings, and submit short homework pieces each week.

**Method, Point of view, and Attainment levels of Evaluation**
The final semester grade will be decided upon by participation in class lectures and attendance (65%) and a written essay (35%) to be submitted at the end of the course.

**Textbook**
Not used
Materials will be prepared for use in the class. Most weeks have pre-prepared class notes and a main text to read.

**Reference book, etc.**
(Reference book)
Introduced during class

**Regarding studies out of class (preparation and review)**
Students will have readings prepared for each week along with class notes.

**Others (office hour, etc.)**
Office hours are Mondays 4th period.
## Course title
Human Geography-E2

## Affiliated department, Job title, Name
Graduate School of Global Environmental Studies
Senior Lecturer, BAARS, ROGER CLOUD

## Group, Field(Classification), Language, Old group, Number of weekly time blocks, Day/period
Humanities and Social Sciences, Regions and Cultures (Foundations), English, Group A, 1, Thu.2

## Number of credits, Course offered year/period
2, 2018 • Second semester

## Eligible students
For all majors

### [Outline and Purpose of the Course]
The course investigates the spatial organisation of human action and the relationships between society and environment and offers a critical exploration of the interactions between people, place and space through the core themes of globalisation, development, urbanisation, diversity and inequality. The course explores the ways in which both local and global forces continuously shape socio-cultural and economic landscapes.

### [Course Goals]
The course equips students with basic concepts in human geography required to understand, interpret and synthesise information on the world around us. Students develop the ability to use geography and spatial perspectives to think creatively and critically about human interactions with the environment.

### [Course Schedule and Contents]

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>What is Human Geography? A Brief Overview</td>
</tr>
<tr>
<td>2</td>
<td>Past Worlds and the Rise of Capitalism</td>
</tr>
<tr>
<td>3</td>
<td>Populations and Demographic Change</td>
</tr>
<tr>
<td>4</td>
<td>Resources, Development, and the Environment</td>
</tr>
<tr>
<td>5</td>
<td>Global Differences and Inequality</td>
</tr>
<tr>
<td>6</td>
<td>Urban and Rural Geographies</td>
</tr>
<tr>
<td>7</td>
<td>Social Construction of Nature</td>
</tr>
<tr>
<td>8</td>
<td>Culture and Global Change</td>
</tr>
<tr>
<td>9</td>
<td>Geographies of the Economy</td>
</tr>
<tr>
<td>10</td>
<td>Global Production and Exchange of Labour</td>
</tr>
<tr>
<td>11</td>
<td>Geographies of Consumption</td>
</tr>
<tr>
<td>12</td>
<td>Money, Space, and Power</td>
</tr>
<tr>
<td>13</td>
<td>Territory, Space, and Geopolitics</td>
</tr>
<tr>
<td>14</td>
<td>Course Review</td>
</tr>
</tbody>
</table>

### [Class requirement]
You are curious to explore the value of human geography in understanding the world around you.

### [Method, Point of view, and Attainment levels of Evaluation]
40% Attendance and in-class discussion and participation, 20% Research Summary (500-800 words), 40% Essay (1500 words)

### [Textbook]
Required readings and materials will be distributed in class.

---

Reference book, etc.

Introduced during class

Regarding studies out of class (preparation and review)

Students are expected to prepare for each class and be ready to discuss the weeks topics in small groups. Preparatory materials include academic readings, news pieces and online media materials.

Others (office hour, etc.)

Please email the instructor.

---

Lecture code: H802003
### [Outline and Purpose of the Course]

This course provides a critical introduction to what it means to be a person as experienced through their gender. This course will explore the various social and cultural contexts of gender through examples from the 20th/21st century Asia-Pacific region. We will draw on comparative material from other places around the globe as well.

### [Course Goals]

The broad goal of this course is to introduce to students to the broad diversity of gender experiences available in today’s highly globalized societies. In particular, the course will give students an analytical framework to contextualize this gender diversity and its continual transformation over the past couple of centuries to situate their own experiences. At the end of the course, students will have increased ability to give balanced consideration to the expression of individual gendered points of view and sexual orientation in different cultural contexts.

### [Course Schedule and Contents]

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction and Overview of the Course</td>
</tr>
<tr>
<td>2</td>
<td>Mapping Gender</td>
</tr>
<tr>
<td>3</td>
<td>Fluid Gender and Sexualities</td>
</tr>
<tr>
<td>4</td>
<td>Plural Co-existence in Southeast Asia (1)</td>
</tr>
<tr>
<td>5</td>
<td>Plural Co-existence in Southeast Asia (2)</td>
</tr>
<tr>
<td>6</td>
<td>Production and Reproduction within the Household: Japan</td>
</tr>
<tr>
<td>7</td>
<td>The Role of National Discourses in the Construction of Gender: Japan</td>
</tr>
<tr>
<td>8</td>
<td>The emotional commons: Labor migration and the globalization of care work (1)</td>
</tr>
<tr>
<td>9</td>
<td>The emotional commons: Labor migration and the globalization of care work (1)</td>
</tr>
<tr>
<td>10</td>
<td>The Gender See-saw: Inequality/Equality (1)</td>
</tr>
<tr>
<td>11</td>
<td>The Gender See-saw: Inequality/Equality (2)</td>
</tr>
<tr>
<td>12</td>
<td>“Naturalizing” Bodies</td>
</tr>
<tr>
<td>13</td>
<td>Body Imaging (1): The Construction of Masculinity</td>
</tr>
<tr>
<td>14</td>
<td>Body Imaging (1): Deconstructing Masculinity</td>
</tr>
<tr>
<td>15</td>
<td>Re-cap</td>
</tr>
</tbody>
</table>

### [Class requirement]

Students should be able to participate in discussions, do readings (required for participation), and submit short homework pieces each week.

---

Lecture code: H598002
Course title: Introduction to Urban Geography-E2

Affiliated department, Job title, Name: Graduate School of Global Environmental Studies, Senior Lecturer, BAARS, Roger Cloud

Group: Humanities and Social Sciences

Field (Classification): Regions and Cultures (Issues)

Language: English

Old group: Group A

Number of credits: 2

Number of weekly time blocks: 1

Class style: Lecture

Course offered year/period: 2018 • First semester

Day/period: Thu.4

Target year: All students

Eligible students: For all majors

### Outline and Purpose of the Course

The majority of the world’s population live in cities. The course explores the dynamics and transformations of urban places and spaces, which include the origin and evolution of cities, the development of networks of cities bound together by culture, trade, communication and competition, as well as the dynamics of economic restructuring in urban regions.

### Course Goals

The course allows students to develop a critical perspective on dominant neoliberal representations of the city and to explore the great diversity of urban worlds. Students will understand the complexity of human-city relationships and learn how cities are shaped by culture, society, economics, politics, and the environment.

### Course Schedule and Contents

<table>
<thead>
<tr>
<th>Week</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Approaching the City - What is Urban Geography?</td>
</tr>
<tr>
<td>2</td>
<td>Cities for Whom? Critical Urban Geography</td>
</tr>
<tr>
<td>3</td>
<td>Production, Economy, and the City</td>
</tr>
<tr>
<td>4</td>
<td>A World of Cities - Global Urbanisation</td>
</tr>
<tr>
<td>5</td>
<td>Labour and Living in the City</td>
</tr>
<tr>
<td>6</td>
<td>The City as a Space of Social Reproduction</td>
</tr>
<tr>
<td>7</td>
<td>The City, Urban Planning, and Politics</td>
</tr>
<tr>
<td>8</td>
<td>Experiencing Cities - Emotions and Identity</td>
</tr>
<tr>
<td>9</td>
<td>City Marketing and Urban Entrepreneurialism</td>
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<tr>
<td>10</td>
<td>Nature and Environment in the City</td>
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<td>11</td>
<td>Art, Aesthetics, and Urban Space</td>
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<td>12</td>
<td>Alternative Urban Spaces and Politics</td>
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<tr>
<td>13</td>
<td>Urban Crises - Political Unrest</td>
</tr>
<tr>
<td>14</td>
<td>Course Review</td>
</tr>
</tbody>
</table>

### Class Requirement

You are interested in cities, excited about living in one, and want to learn more about them.

### Method, Point of View, and Attainment levels of Evaluation

- 40% Attendance and in-class discussion and participation
- 20% Field Trip Observation (500-800 words)
- 40% Photo Essay (1500 words)

### Textbook

Required readings and materials will be distributed in class.

---

Lecture code: H814001
**Course title**<br>Contemporary Japanese Architecture-E2<br><br>**Affiliated department, Job title, Name**<br>Graduate School of Engineering Professor, DANIELL, Thomas<br><br>**Group**<br>Humanities and Social Sciences<br><br>**Field(Classification)**<br>Regions and Cultures(Issues)<br><br>**Language**<br>English<br><br>**Groups**<br>Old group, Group A<br><br>**Number of credits**<br>2<br><br>**Number of weekly time blocks**<br>1<br><br>**Eligible students**<br>For all majors<br><br>**Target year**<br>Mainly 1st year students<br><br>**Day/period**<br>Tue.3<br><br>**Class style**<br>Lecture<br><br>**Course offered year/period**<br>2018 • First semester<br><br>### [Outline and Purpose of the Course]

This course provides an overview of developments in Japanese architecture from the 1960s until the present day. Topics range from the visionary city plans of the Metabolist group in the 1960s, to the small experimental houses of the 1970s, to the spectacular buildings enabled by the economic "bubble" of the 1980s, to the humble observation and experimentation during the "lost decade" of the 1990s, to the situation following the 3/11 Tohoku earthquake. The presentations will not be completely chronological but rather focused on specific themes.

### [Course Goals]

Students will learn to recognize the various styles and types of architecture, including specific architects, periods, and locations of important buildings; to understand the climatic, technological, socioeconomic, and cultural factors that have shaped and sustained architecture and urban design; to employ basic methods of data collection in research, and assemble this research into a coherent structure; to read, write, listen, and speak cogently, and present research findings to an audience.

### [Course Schedule and Contents]

- **Week 1:** Metabolism: Kenzo Tange, Kisho Kurokawa, et al
- **Week 2:** House versus City: Kazuo Shinohara, Arata Isozaki, et al
- **Week 3:** The Bubble: Toyo Ito, Shinsaku Takamatsu, et al
- **Week 4:** Material Expression: Osamu Ishiyama, Team Zoo, et al
- **Week 5:** Conceptual Composition: Hiromi Fujii, Takefumi Aida, et al
- **Week 6:** Women Architects: Itsuko Hasegawa, Kazuyo Sejima, et al
- **Week 7:** Hara School: Kengo Kuma, Kiyoshi Seye Takeyama, et al
- **Week 8:** Street Observation: Terunobu Fujimori, Atelier Bow-Wow, et al
- **Week 9:** New Generation: Sou Fujimoto, Akihisa Hirata, et al
- **Week 10:** Review
- **Week 11:** Review
- **Week 12:** Student presentations
- **Week 13:** Student presentations
- **Week 14:** Student presentations

### [Class requirement]

None

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**Contemporary Japanese Architecture-E2(2)**

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

Grades will be determined by a combination of attendance, class participation, presentations, and reports.

**[Textbook]**


**[Reference book, etc.]**

- Rem Koolhaas and Hans Ulrich Obrist Project Japan: Metabolism Talks... (Cologne: Taschen, 2011)

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

Each student must prepare a presentation on a given topic.

**[Others (office hour, etc.)]**

Office hours will be announced in class. For questions about the course or to arrange a meeting, email the instructor.

---

Lecture code: H813001
Course title: Environmental Anthropology-E2

English

Graduate School of Asian and African Area Studies

Department: Associate Professor, D’SOUZA, Rohan Ignatious

Humanities and Social Sciences

Field (Classification): Regions and Cultures (Issues)

Language: English

Group: Old group, Group A

Number of students: Number of credits: 2

Number of weekly time blocks: 1

Class style: Lecture

Course offered year/period: 2018 • First semester

Eligible students: For all majors

[Outline and Purpose of the Course]

This course will introduce students to four defining anthropologically inspired frameworks that have been critical in exploring the many fraught relationships between Nature and Culture. These frameworks or ideological perspectives have in actual fact driven the field of ecological and environmental anthropology by sparking innumerable debates, discussions and sharp disagreements. The true weight of this scholarship, however, as this course will empathize and outline, lies not only in the empirically informed insights that have been generated over the years but the riveting theories that have helped us reflect on the Nature-Culture divide and overlap.

[Course Goals]

The Nature-Culture divide has been foundational in defining a range of philosophical and political attitudes. This course is intended to help navigate the complex theory laden understanding of how humans have interacted with and shaped their environments.

[Course Schedule and Contents]

Each class will comprise a 90 minute session; involving a lecture of 60 minutes and followed by a 30 minute interactive discussion in which student participation will be elicited through either group or individual presentations.

Four themes will be covered:

a) Cultural Ecology
b) Socio-Biology
c) Conservation Ecology
d) Political Ecology

[Class Requirement]

None

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

There will be a regular cycle of written submissions and feedback through class discussions and teacher evaluations. The idea is to develop a credible capacity for reading and writing amongst those who take up the course. Evaluations will be based on class presentations, writing assignments and tutorials.
Food and Globalization I-E2(2)

[Outline and Purpose of the Course]
This course is about the dramatic changes to food systems worldwide under globalization. The story begins with early trade and the movement of different crops from their origins, including potatoes, coffee, wheat, rice and bananas. Through cultural integration, certain foods became staples and others became traded commodities. We will explore the transformation of food from a local phenomenon to a globalized industry.

[Course Goals]
In this course, students will learn about the basic trends that have impacted and shaped food systems around the world. Students will apply the approach of historical food systems using the 'One Food Method'.

[Course Schedule and Contents]
Introduction
1. A true global traveler: the story of the humble potato

Module 1: The mobility of food
2. The origins of food and their first travels
3. Early trade: diversity and survival
4. Middle trade: luxury and new tastes
5. Latter trade: efficiency and cultural exchange

Module 2: The mobility of farming
6. Farming overseas and comparative advantage
7. Technology transfer and the Green Revolution
8. The politics of food prices, subsidies, trade

Module 3: The transformation of our foods
9. Corporate consolidation of the global food trade
10. Local to global and back again: food movements
11. The single-food approach: The story of Milk

Module 4: Student Presentations
12. The story of a staple grain
13. The story of a livestock product
14. The story of a fruit

[Class requirement]
English proficiency suitable for understanding lectures, reading basic texts, and participating in class discussion.

Lecture code: H808001

Food and Globalization I-E2(2)

(Method, Point of view, and Attainment levels of Evaluation]
40% Attendance and quizzes (* 4 or more absences without official loses attendance grade)
20% Final presentation and peer evaluations
40% Final examination

[Textbook]
Not used
No textbook, but consultation of in-class materials and eBooks available at Kyoto University Library (see Reference book).

[Reference book, etc.]

[Regarding studies out of class (preparation and review)
Students will be expected to do readings or watch movies in preparation for class and discuss them the following week. Alternatively, students will conduct take home practical exercises which must be submitted the following week.

[Others (office hour, etc.)]
Short meetings can be spontaneous or scheduled. Longer meetings scheduled only by email.
Introduction to Globalization I-E2

[Outline and Purpose of the Course]
This course introduces students to some core processes that underlie present day globalization. This is a seminar based course and will act as a stepping stone for students to learn and explore what ways different aspects on globalization play out in Asia-pacific, Southeast Asia and other regions in the world.

[Course Goals]
Each week will consist of a brief lecture based on readings (and some class notes) followed by a class discussion and group exercises. The main goal of the course is to give students a critical introduction to the way global processes play out in the domains of the economy, ecology, politics, and society. Students will receive a grounding on the various ways in which global issues affect everyday life in the present and future and ask them to think about the different ways we measure them.

[Course Schedule and Contents]
Week 1. Overview
Week 2. The Politics of Enough
Week 3. The Limits of Growth
Week 4. The Idea of De-growth
Week 5. Viewing Growth through GDP
Week 6. The Rise of Neoliberal Economies
Week 7. Financial Crisis
Week 8. Prosperity as an Obtainable Goal?
Week 9. Assessing the Potentiality of Global Regions
Week 10. Measuring Global Conditions: Global Indicators
Week 11. Measuring Potentiality for the 21st Century
Week 12. Producing Indexes to Monitor Global Change
Week 13. Competing Claims and Rivalries: The South China Sea (1)
Week 14: Competing Claims and Rivalries: The South China Sea (2)
Week 15. Recap

[Class requirement]
Students should be able to participate in discussions, do readings, and submit short homework pieces

[Method, Point of view, and Attainment levels of Evaluation]
The final semester grade will be decided upon by participation in class lectures participation (35%) and a written essay (30%) and group work (35%) through the course.

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Lecture code: H591001
Lecture code: H806001

Introduction to Urban Planning-E2

[Course title]<English>
Introduction to Urban Planning-E2

Affiliated department, Job title, Name
Disaster Prevention Research Institute
Associate Professor, SAMADDAR, Subhajyoti

Group
Humanities and Social Sciences
Field(Classification)
Regions and Cultures(Issues)

Language
English
Old group
Group A
Number of credits
2

Number of weekly time blocks
1
Class style
Lecture
Course offered year/period
2018・First semester

Day/period
Wed.3
Target year
1st & 2nd year students
 Eligible students
For all majors

[Outline and Purpose of the Course]

This course provides an overview of the conceptual ideas and some popular methods and practices in urban and city planning. This course would explore the origins and evolution of the urban world. It would outline major developments, ideas, practices that have influenced both cities and urban planning. It will highlight both the theoretical debates and practical challenges that urban planners are likely to encounter; and discuss problem-solving techniques and strategies popular in planning practices.

[Course Goals]

To introduce major theories and concepts in urban planning.
To understand the socio-economic, political and environmental forces that influence the planning processes.
To learn and get introduced with various planning tools and techniques.
To know various practical challenges in urban planning.

[Course Schedule and Contents]

1. What is urban planning? (Week 1 to 2)
2. History of city: Urbanization, Sub-urbanization and Re-urbanization. (Week 3 and 4)
3. History of urban planning: An overview (Week 5 to 7)
4. Major contemporary urban planning approaches (Week 8 to 10)
5. Popular methods and tools in urban planning. (Week 11 to 12)
6. Urban Governance and public participation (Week 13)
7. Current challenges of urban planning (Week 14)
8. Final exam (Week 15)
9. Feedback Class (Week 16)

[Class requirement]

None

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

Assignment -1 (40 points)
Mid-term class exam - 1 (30 points)
Final exam (30 points)

[Textbook]

Instructed during class

The City in History: Its Origins, Its Transformations, and Its Prospects: By Lewis Mumford (1972)
Good City Form - by Kevin Lynch (1995).

[Reference book, etc.]

[Introduction to Urban Planning-E2(2)]

[Introduction to Urban Planning-E2(2)]

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

- Prepare and review class contents, reading textbooks.
- Complete a short assignment.

[Others (office hour, etc.)]
Introduction to Urban Geography-E2

[Outline and Purpose of the Course]
The majority of the world’s population live in cities. The course explores the dynamics and transformations of urban places and spaces, which include the origin and evolution of cities, the development of networks of cities bound together by culture, trade, communication and competition, as well as the dynamics of economic restructuring in urban regions.

[Course Goals]
The course allows students to develop a critical perspective on dominant neoliberal representations of the city and to explore the great diversity of urban worlds. Students will understand the complexity of human-city relationships and learn how cities are shaped by culture, society, economics, politics, and the environment.

[Course Schedule and Contents]
Week 1: Approaching the City - What is Urban Geography?
Week 2: Cities for Whom? Critical Urban Geography
Week 3: Production, Economy, and the City
Week 4: A World of Cities - Global Urbanisation
Week 5: Labour and Living in the City
Week 6: The City as a Space of Social Reproduction
Week 7: The City, Urban Planning, and Politics
Week 8: Experiencing Cities - Emotions and Identity
Week 9: City Marketing and Urban Entrepreneurialism
Week 10: Nature and Environment in the City
Week 11: Art, Aesthetics, and Urban Space
Week 12: Alternative Urban Spaces and Politics
Week 13: Urban Crises - Political Unrest
Week 14: Course Review

[Class requirement]
You are interested in cities, excited about living in one, and want to learn more about them.

[Method, Point of view, and Attainment levels of Evaluation]
40% Attendance and in-class discussion and participation, 20% Field Trip Observation (500-800 words), 40% Photo Essay (1500 words)

[Textbook]
Required readings and materials will be distributed in class.
### Course title
Theory of Landscape Design-E2: House and Gardens of Kyoto

### Affiliated department, Job title, Name
Graduate School of Engineering
Professor, DANIELL, Thomas

### Group
Humanities and Social Sciences
Field(Classification): Regions and Cultures
Issues:

### Language
English

### Number of weekly time blocks
1

### Class style
Lecture

### Course offered year/period
2018 • Second semester

### Eligible students
For all majors

### Outline and Purpose of the Course
This course introduces a broad array of Kyoto's traditional houses and gardens from every period of the city's history. These range from summer villas to townhouses, from monumental Buddhist temples to insubstantial garden pavilions, from personal homes to traditional inns. All have their associated outdoor spaces, whether condensed courtyard gardens, picturesque stroll gardens, "dry landscape" stone gardens, or the "borrowed scenery" of distant landscapes.

### Course Goals
Students will learn to recognize the various historical styles and types of architecture, including specific periods and locations of important buildings; to understand the climatic, technological, socioeconomic, and cultural factors that have shaped them; to employ basic methods of data collection in research, and assemble this research into a coherent structure; to read, write, listen, and speak cogently, and present research findings to an audience.

### Course Schedule and Contents

<table>
<thead>
<tr>
<th>Week</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction and overview: shinden, shoin, sukiya</td>
</tr>
<tr>
<td>2</td>
<td>Aristocratic villas: Katsura, Shugakuin, Kinkaku-ji, Ginkaku-ji, Byodo-in, etc.</td>
</tr>
<tr>
<td>3</td>
<td>Temple residences: Nanzen-ji, Tofuku-ji, Ryogen-in, Kanchi-in, Shoren-in, Ninna-ji, etc</td>
</tr>
<tr>
<td>4</td>
<td>Site visit</td>
</tr>
<tr>
<td>5</td>
<td>Site visit</td>
</tr>
<tr>
<td>6</td>
<td>Traditional townhouses: Kinpyo, Kinmata, Inakatei, Iori Suijiya-cho, Iori Zaimoku-cho, etc</td>
</tr>
<tr>
<td>7</td>
<td>Site visit</td>
</tr>
<tr>
<td>8</td>
<td>Traditional inns: Hiiragiya, Yoshida Sanso, Gion Hatanaaka, Rangetsu, Momijiya, Miyamaso, etc</td>
</tr>
<tr>
<td>9</td>
<td>Site visit</td>
</tr>
<tr>
<td>10</td>
<td>Site visit</td>
</tr>
<tr>
<td>11</td>
<td>Site visit</td>
</tr>
<tr>
<td>12</td>
<td>Private retreats: Kawai Kanjiro Memorial House, Shigemori Mirei Garden Museum, Suisen-an, etc</td>
</tr>
<tr>
<td>13</td>
<td>Site visit</td>
</tr>
<tr>
<td>14</td>
<td>Review</td>
</tr>
</tbody>
</table>

### Class requirement
None

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**Theory of Landscape Design-E2: House and Gardens of Kyoto(2)**

**[Method, Point of view, and Attainment levels of Evaluation]**
Grades will be determined by a combination of attendance, class participation, presentations, and reports.

**[Textbook]**
- Thomas Daniell 『Houses and Gardens of Kyoto』 (Tokyo: Tuttle, 2010)

**[Reference book, etc.]**

**[Regarding studies out of class [preparation and review]]**
Readings and research assignments.

**[Others [office hour, etc.]]**
Office hours will be announced in class. For questions about the course or to arrange a meeting, email the instructor.

Lecture code: H812001
Course title: Environmental Histories of South Asia-E2

Group: Humanities and Social Sciences
Field(Classification): Regions and Cultures(Issues)

Language: English
Old group: Group A
Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • Second semester
Day/period: Fri.3

Eligible students: For all majors

Outline and Purpose of the Course:
This is designed as an introductory course that will familiarise students with several of the critical debates that have shaped environmental history writings on South Asia. The emphasis will be on rehearsing not only the distinct conceptual and theoretical claims but, significantly as well, survey the rich and complex socio-ecological worlds that have been revealed such writing on South Asia.

Course Goals:
Given that the environmental question has become central to discussions about sustainability and climate change, this course will help students understand the unique histories of ecological change in South Asia. It will not only enable students to grasp the ruptural and often times dramatic environmental transformations that continue to shape contemporary South Asia but brings into relief the complicated pathways of modernity.

Course Schedule and Contents:
Each class will comprise a 90 minute session; involving a lecture of 60 minutes and followed by a 30 minute interactive discussion in which student participation will also be elicited through either group or individual presentations.
Four themes will be covered:
a) The Colonial Watershed Thesis
b) Continuity and Change
c) Forest Protection, Hunting and Colonial Hydrology
d) Conservation, environmental change and the Colonial State

Class requirement:
None

Method, Point of view, and Attainment levels of Evaluation:
There will be a regular cycle of written submissions and feedback through class discussions and teacher evaluations. The idea is to develop a credible capacity for reading and writing amongst those who take up the course.
Evaluations will be based on class presentations, writing assignments and a tutorial.

Textbook:
Not used

Reference book, etc.:

Related URL:
(Relevant sections and chapters from the above books will be assigned as readings for the course. Other reading materials such as articles or short write-ups may be included based on class discussions and interest.)

Regarding studies out of class [preparation and review]:
Students will be expected to have read at least five pages of pre-assigned reading, at the very minimum, before attending each class.

Others (office hour, etc.): Students can meet me during office hours with prior appointment.
# Food and Globalization II-E2

## [Outline and Purpose of the Course]
This course surveys modern transformations to food systems worldwide under globalization. The topics cover the debate between global vs. local from both sympathetic and critical perspectives. In more detail, we explore what happened after food became a globalized industry and how new food trends began to change the way farming is done and how people eat worldwide.

## [Course Goals]
In this course, students will gain a basic understanding about the contemporary trends in food systems around the world, particularly the impact of globalization, dietary transition, and food movements. Students will apply the approach of class to analyze one contemporary trend in agriculture.

## [Course Schedule and Contents]

### Introduction
1. Food after globalization

### Module 1: Challenges to global food
2. Overproduction and alternative uses: sweeteners, fodder, energy
3. Global diet trends from malnutrition to overnutrition
4. Rising incomes, rising food prices
5. Environmental consequences of food production

### Module 2: Revival of local food
6. New farmer-consumer relationships: fairtrade, farmer markets, farm-to-fork
7. Youth and small farm romanticism
8. Urban agriculture
9. Challenges to local food in a global world

### Module 3: Global-Local contradictions
10. World trade in specialty local products: geographic indications
11. Unexpected local specialties: Hokkaido dairy

### Module 4: Student Presentations
12. Mega-agriculture
13. Small-scale food systems
14. New diets: innovation or marketing?
15. Key lessons of global food

## [Class requirement]
English proficiency suitable for understanding lectures, reading basic texts, and participating in class discussion. [Not required, but to round out understanding of world food systems, interested students are encouraged to take Food and Globalization I in the Spring Semester.]

## [Method, Point of view, and Attainment levels of Evaluation]
40% Attendance and quizzes (* 4 or more absences without official loses attendance grade) 20% Final presentation and peer evaluations 40% Final examination

## [Textbook]
Not used
No textbook, but consultation of in-class materials and eBooks available at Kyoto University Library (see Reference book).

## [Reference book, etc.]

## [Regarding studies out of class (preparation and review)]
Students will be expected to do readings or practical exercises, or watch movies in preparation for class and take short quizzes. Students should be ready to discuss the topic of the week in class.

## [Others (office hour, etc.)]
Short meetings can be spontaneous or scheduled. Longer meetings scheduled only by email.
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<thead>
<tr>
<th>Group</th>
<th>Humanities and Social Sciences</th>
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<tr>
<td>Affiliated department, Job title, Name</td>
<td>Center for Southeast Asian Studies, Associate Professor, LOPEZ, Mario Ivan</td>
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<td>Field(Classification)</td>
<td>Regions and Cultures(Issues)</td>
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<td>Language</td>
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<tr>
<td>Eligible students</td>
<td>For all majors</td>
</tr>
</tbody>
</table>

### [Outline and Purpose of the Course](#)

Human Societies are often characterized by their dynamic populations. These often include people who are born in one country but live and reside in another. This course introduces students to present day global movement and the different conditions of people who move and settle in other countries. This is a seminar based course and aims to help students learn and explore the ways human movement plays out Asia-pacific, Southeast Asia, and other regions in the world.

### [Course Goals](#)

Each week will consist of a brief lecture based on readings (and some class notes) followed by a class discussion and group exercises. The main purpose is to give students a critical introduction to the way present day globalization processes affect the lives of migrants, immigrants and refugees and stimulate discussion on the human dimensions of movement.

### [Course Schedule and Contents](#)

- **Week 1. Overview**
- **Week 2. Who is a Migrant?**
- **Week 3. Global Migration in the 21st Century**
- **Week 4. Statelessness: Causes and Consequences (1)**
- **Week 5. Statelessness: Causes and Consequences (2)**
- **Week 6. Refugees and the International Refugee Regime**
- **Week 7. Media images of refugees and migrants**
- **Week 8. Migrant Voices and Literature**
- **Week 9. Demonizing Discourses: Media Constructions of Refugees**
- **Week 10. Managing Migration: Singaporean Case Study**
- **Week 11. Managing Migration: Japanese Case Study**
- **Week 12. Caring for the Future: Highly Skilled Migration Labor**
- **Week 13. Integrating Global Care: Germany, Japan and the Philippines**
- **Week 14. Migrants: Winners or Losers of Migration?**
- **Week 15. Re-cap**

### [Class requirement](#)

Students should be able to participate in discussions, do readings and submit short homework pieces each week.

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Lecture code: H592001

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

The final semester grade will be decided upon by participation in class lectures and an online forum (35%), participation (including a group test) (35%) and a written essay (30%) to be submitted at the end of the course.

### [Textbook](#)

Not used

### [Reference book, etc.](#)

(Reference book)

Introduced during class

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

Each week will consist of materials to be prepared in advance for class discussion.

### [Others (office hour, etc.)](#)
**Course title**<br><br>Topics in Human Geography VII-E2 (Population and Mobility)<br><br>**Affiliated department, Job title, Name**<br>Graduate School of Global Environmental Studies Associate Professor, SINGER JANE

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

This course looks at global trends in population change and mobility, including population growth; declining and aging populations; displacement due to development, conflict or climate change; urban migration and international migration. By carrying out a simulated stakeholder negotiation exercise, students will understand the complex issues involved.

**[Course Goals]**

Students will be able to understand many of the complex causes and impacts of population trends and mobility. They will consider many of the ethical questions involved, such as government obligations for accepting refugees or those displaced by climate change, the roles of various stakeholders in assisting the displaced, and unequal impacts of development and globalization.

**[Course Schedule and Contents]**

Class 1: Introduction and overview. Demographic trends and population issues
Class 2: Population booms vs. population declines and aging
Class 3: Japan’s rural crisis: Can we revitalize rural areas?
Class 4: Displacement due to conflict, development and environmental change
Class 5: Migration: pull and push factors
Class 6: Urban migration trends and issues
Class 10-11: Globalization and transborder movement
Class 12-14: Stakeholder analysis and stakeholder negotiation: preparation, implementation and feedback

Note: The schedule may change slightly depending on class requirements

**[Class requirement]**

None

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

Evaluation will be based on class attendance and active participation (30%), short assignments and classroom exercises (30%), a mid-term test (25%) and participation in the final simulation exercise (15%).

**[Textbook]**

No text; required readings and lecture notes will be distributed in class.

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Lecture code: H599001
Topics in Human Geography VI-E2 (Culture and Connectivity)

Course title: Topics in Human Geography VI-E2 (Culture and Connectivity)
Affiliated department, Job title, Name: Not fixed
Group: Humanities and Social Sciences
Field(Classification): Regions and Cultures (Issues)
Language: English
Old group: Group A
Number of weekly time blocks: 1
Course offered year/period: 2018 • Second semester
Day/period: Mon.3
Target year: Mainly 1st & 2nd year student
Eligible students: For all majors

[Outline and Purpose of the Course]
Topics in Human Geography will explore issues of culture, community and connectivity across space and time. In this class we will focus on historical and contemporary flows of people and ideas throughout the Asia-Pacific region. We will take Southeast Asia as a pivot from which we can understand ideas of locality, tradition, mobility, adaptation and social dynamism within larger contexts of human geography.

[Course Goals]
The goal of this course is to familiarize ourselves with the basic concepts of Human Geography in the context of globalization. By the end of the course, we will have developed analytical skills and nuanced perspectives for examining the global issues that affect us locally.

[Course Schedule and Contents]
Week 1 Introduction: People and place in the Asia-Pacific region
Week 2 Mapping Asia: Cartography and the creation of a region
Week 3 Mapping nations: The rise of states and creation of national cultures
Week 4 Individual Research Papers
Week 5 Mountainous Asia: People, livelihoods and elevation
Week 6 Insular Asia: Maritime society on the move
Week 7 Sanskrit cultural area
Week 8 Arabic cultural area
Week 9 Chinese cultural area
Week 10 Urban Asia
Week 11 Linguistic landscapes: Language, politics and identity in urban space
Week 12 Religion: Local, regional and global linkages
Week 13 Popular culture: Regional flows of soft power
Week 14 Regional development: Greater Mekong Sub-region
Week 15 Final review discussions

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Students will be evaluated on attendance, class participation, submission of weekly reflections and an individual research paper.

[Textbook]
Not used

[Reference book, etc.]
Weightman Barbara 「Tigers and Dragons: Geography of South, East and Southeast Asia」 (Wiley) ISBN: 9780470876282

[Regarding studies out of class (preparation and review)]
Students will be expected to prepare for each class and be ready to discuss the week’s topics in a group. Preparatory materials will include readings and others such as podcasts and short documentaries.

[Others (office hour, etc.)]
Office hours can be arranged as necessary.
[Outline and Purpose of the Course]
This course will give an outline of some major legal issues in Japan, and explain the cultural and social elements behind them. Further, it will demonstrate the mutual relation between law and culture in Japan, especially focusing on two topics: (1) law in everyday life, and (2) social issues and the law. Along the way, relevant cases decided by Japanese courts will also be discussed. The goal of this course is for students to acquire a basic knowledge of the structure and current state of Japanese law, and get to comprehend and analyze representative legal issues of everyday life. An additional goal is for students to deepen their understanding of Japanese society and culture. During this course, students will be given the opportunity to actively participate in discussions and exchange of ideas.

[Course Goals]
- Understanding the basics of law in modern Japanese society.
- Getting able to comprehend and analyze representative legal issues of everyday life.
- Deepening the understanding of Japanese society and culture.

[Course Schedule and Contents]
1 Introduction
2 Significance and foundations of law
3 Sources and categories of law
4 Trials, structure of courts and legal professions
5 Law in everyday life I: Minors and the law
6 Law in everyday life II: Elderly people and the law
7 Law in everyday life III: Family and the law
8 Law in everyday life IV: Contracts in Japan
9 Law in everyday life V: Consumer protection and contracts
10 Social issues and the law I: Money lending
11 Social issues and the law II: Organized fraud
12 Social issues and the law III: Product safety
13 Social issues and the law IV: False accusations in criminal cases
14 Social issues and the law V: Bioethics
15 Final exam
Feedback (the method will be explained later)
Contemporary Economics I-E2

This is an introductory undergraduate course, teaching the fundamentals of modern microeconomics' theory with applications to current economic issues in practice. The course provides students with a solid foundation for microeconomic analysis and motivates them to engage in further economic studies.

**Course Goals**
- knowing the history of economic thought
- understanding the basic principles of economics as a special social science, the functioning of the market, and its limits
- applying analytical skills to current economic problems

**Course Schedule and Contents**

The course starts with the basic principles of economics such as methodological individualism and rational behavior. It then gives an introduction to economic history from the economic classics to modern economic theory with a special focus on microeconomic thinkers. The course continues with an introduction to supply and demand as the basic forces determining market equilibriums. Next, it analyzes the benefits of market allocation. The course finishes with the treatment of market failure such as external effects and public goods, and a special discussion on the application of microeconomics to climate policy.

1. Introduction and Definition of Economics
2. Principles of Economics
3. Adam Smith and the Early History of Microeconomic Thought
4. The Later History of Microeconomic Thought and the Division of Labor
5. Coordination by Markets
6. Market Demand and Supply
7. Welfare Effects of Markets
8. Government Intervention
9. Role of Governments
10. Market Failure: Public Goods
11. Market Failure: External Effects
12. Students' Conference on Selected Microeconomic Topics
13. Students' Conference on Selected Microeconomic Topics
14. Students' Conference on Selected Microeconomic Topics

Principles of Teaching:
The course uses a problem-oriented approach by confronting students with real-life economic problems and providing them with microeconomics' tools to solve these problems. Students' active participation in the classroom is essential for its success. Lectures will be accompanied by group-works, role plays, small talks etc. throughout the semester.

**Method, Point of view, and Attainment levels of Evaluation**
- class participation: 1/3 each for assignments, presentations, and the final seminar paper
- assignments and presentations
- the final seminar paper

**Textbook**

**Reference book, etc.**

**Regarding studies out of class (preparation and review)**
- prepare and review class contents e.g. by textbook readings
- complete short assignments on a regular basis, prepare presentations, and write a short seminar paper

**Others (office hour, etc.)**
to be announced
<table>
<thead>
<tr>
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<th>Affiliated department, Job title, Name</th>
<th>Graduate School of Economics Program Specific Associate Professor, Sven Rudolph</th>
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<tr>
<td>Contemporary Economics I-E2</td>
<td>Jurisprudence, Politics and Economics (Foundations)</td>
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<td>Thu.4</td>
<td>Lecture</td>
<td>2018 • First semester</td>
<td>For all majors</td>
<td>All students</td>
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**[Outline and Purpose of the Course]**

This is an introductory undergraduate course, teaching the fundamentals of modern microeconomics' theory with applications to current economic issues in practice. The course provides students with a solid foundation for microeconomic analysis and motivates them to engage in further economic studies.

**[Course Goals]**

- knowing the history of economic thought
- understanding the basic principles of economics as a special social science, the functioning of the market, and its limits
- applying analytical skills to current economic problems

**[Course Schedule and Contents]**

Content, Outline, Schedule:
The course starts with the basic principles of economics such as methodological individualism and rational behavior. It then gives an introduction to economic history from the economic classics to modern economic theory. The course continues with an introduction to supply and demand as the basic forces determining market equilibriums. Next, it analyzes the benefits of market allocation. The course finishes with the treatment of market failure such as external effects and public goods, and a special discussion on the application of microeconomics to climate policy.

1 Introduction and Definition of Economics  
2 Principles of Economics  
3 Adam Smith and the Early History of Microeconomic Thought  
4 The Later History of Microeconomic Thought and the Division of Labor  
5 Coordination by Markets  
6 Market Demand and Supply  
7 Welfare Effects of Markets  
8 Government Intervention  
9 Role of Governments  
10 Market Failure: Public Goods  
11 Market Failure: External Effects  
12 Students' Conference on Selected Microeconomic Topics  
13 Students' Conference on Selected Microeconomic Topics  
14 Students' Conference on Selected Microeconomic Topics  

Principles of Teaching:
The course uses a problem-oriented approach by confronting students with real-life economic problems and providing them with microeconomics' tools to solve these problems. Students' active participation in the course is essential for its success. Lectures will be accompanied by group-works, role plays, small talks throughout the semester.

**[Class requirement]**

None

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

class participation; 1/3 each for assignments, presentations, and the final seminar paper

**[Textbook]**

Mankiw, NG/Taylor, MP  [Economics, 2nd revised edition (2011)]  (Cengage Learning EMEA)

**[Reference book, etc.]**

Pindyck, SP/Rubinfeld, DL  [Microeconomics. 8th Edition (2012)]  (Prentice Hall)

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

- prepare and review class contents e.g. by textbook readings  
- complete short assignments on a regular basis, prepare presentations, and write a short seminar

**[Others (office hour, etc.)]**

to be announced

Lecture code: H917002
Introduction to Economics-E2

Institute of Economic Research
Associate Professor, NEWTON, Jonathan Charles Scott

Humanities and Social Sciences
Jurisprudence, Politics and Economics/Foundations

English

Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • First semester

Day/period: Thu.1
Target year: Mainly 1st year students
Eligible students: For all majors

[Outline and Purpose of the Course]
This course is an introduction to economics, covering essential economic concepts (gains from trade, marginal costs, solutions to basic economic models) in both a qualitative and a quantitative manner.

The purpose of the course is to give students an understanding of economic concepts and methods which they can then take to further, more detailed, study of the subject.

[Course Goals]
~ To introduce important economic concepts and illustrate these with examples.
~ To give some ability to consider real world phenomena through economic thinking.
~ To prepare students for further study of economics.

[Course Schedule and Contents]
Each week part of the textbook or other relevant readings will be covered in class. The course consists of the following 7 topics, each of which will be covered in 2 time blocks (approximately 3 hours of class time):

1. Gains from trade.
2. Demand and supply.
3. Production, equilibrium and welfare.
4. Perfect competition and monopoly.
5. Monopolistic competition and oligopoly.
7. Public goods and common resources.

[Class requirement]
Students are required to read the assigned texts, attend class and complete assigned questions.

[Textbook]

[Regarding studies out of class (preparation and review)]
The assigned chapters of the textbook, as well as any other readings assigned in class, should be read each week.

[Others (office hour, etc.)]
Office hours to be announced at first lecture.

Economy and Society I-E2

Institute of Economic Research
Associate Professor, NEWTON, Jonathan Charles Scott

Humanities and Social Sciences
Jurisprudence, Politics and Economics/Foundations

English

Number of weekly time blocks: 1
Class style: Seminar
Course offered year/period: 2018 • First semester

Day/period: Thu.3
Target year: Mainly 2nd year students
Eligible students: For liberal arts students

[Outline and Purpose of the Course]
This course is a “Great books” seminar that discusses the book “Convention: A Philosophical Study” by David Lewis.

This book, one of the greatest game theoretic texts of the 20th Century, provides insight into (i) the formation of conventions (e.g. the understandings that cars drive on the left of the road in Japan, but on the right of the road in China); (ii) hierarchies of beliefs (e.g. I know that you know that I know that Alice has red hair); and (iii) signalling and language (conventions that involve information transmission).

The purpose of the course is to come to a thoughtful, nuanced understanding of this text.

[Course Goals]
~ To read, understand and critique “Convention: A Philosophical Study” by David Lewis.
~ To improve critical reading skills.
~ To prepare students for further analytical work in game theory, economics, sociology or philosophy.

[Course Schedule and Contents]
Each week a chapter or part of a chapter will be discussed in class. The course consists of the following 7 topics, each of which will be covered in 2 time blocks (approximately 3 hours of class time):

1. Coordination problems.
2. What is a convention?
3. Common knowledge.
4. Knowledge and conventions.
5. Formation of conventions.
7. Language and convention.

[Class requirement]
Students are required to read the assigned texts, attend class and participate in discussion.

[Textbook]

[Regarding studies out of class (preparation and review)]
The assigned chapters of the textbook, as well as any other readings assigned in class, should be read each week.

[Others (office hour, etc.)]
Office hour by appointment.
Introduction to Management-E2(2)

[Class requirement]
The lectures will be delivered in English. Students should have an interest in the study of business management in English. Knowledge of management is not a requirement to enroll in this course.

[Method, Point of view, and Attainment levels of Evaluation]
30% class attendance and participation, 30% short essay (500-800 words), and 40% final exam

[Textbook]
Instructed during class

[Reference book, etc.]

[Regarding studies out of class (preparation and review)]
Students will be expected to spend at least 90 minutes outside of class each week on class preparation, readings, and review.

[Others (office hour, etc.)]
Students are welcome to drop by and visit unannounced during regular office hours.

Outline and Purpose of the Course
The purpose of this course is to provide students of all disciplines with the most fundamental and broad overview of contemporary management theories, concepts, and basic practices in the world of business management. The focus of this course is on introducing selected theories, and covering the four primary management functions, including planning, organizing, leading and controlling. Furthermore, this course will explore how to apply various theories and concepts to current business practices.

Course Goals
To understand the main concepts and theories of contemporary management; To acquire preliminary skills to analyze real business problems with the knowledge learned; To understand multiple perspectives and approaches that exist in business practices

Course Schedule and Contents
The following is an overview of what will be covered. Some adjustments may be made to this schedule when necessary.

Week 1 Orientation
Understanding organizational management (week 2 to 5) (1) Classical management theories (2) Management and organizations (3) Organizational design (4) Organizational decision-making

Developing corporate strategies (week 6 to 9) (1) Understanding internal and external environment (2) Strategic management (3) Change and innovation (4) corporate social responsibility and business ethic

Managing people and team (week 10 to 13) (1) Human resource management (2) Team management (3) Organizational communication (4) Diversity management

Week 14: Course summary

Lecture code: H919001
Introduction to Management-E2(2)

[Class requirement]
The lectures will be delivered in English. Students should have an interest in the study of business management in English. Knowledge of management is not a requirement to enroll in this course.

[Method, Point of view, and Attainment levels of Evaluation]
30% class attendance and participation, 30% short essay (500-800 words), 40% final exam

[Textbook]
Instructed during class

[Reference book, etc.]

[Regarding studies out of class (preparation and review)]
Students will be expected to spend about at least 90 minutes outside of class each week on class preparation, readings, and review.

[Others (office hour, etc.)]
Students are welcome to drop by and visit unannounced during regular office hours.

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**Outline and Purpose of the Course**
The purpose of this course is to provide students of all disciplines with the most fundamental and broad overview of contemporary management theories, concepts, and basic practices in the world of business management. The focus of this course is on introducing selected theories, and covering the four primary management functions, including planning, organizing, leading and controlling. Furthermore, this course will explore how to apply various theories and concepts to current business practices.

**Course Goals**
To understand the main concepts and theories of contemporary management;
To acquire preliminary skills to analyze real business problems with the knowledge learned;
To understand multiple perspectives and approaches that exist in business practices

**Course Schedule and Contents**
The following is an overview of what will be covered. Some adjustments may be made to this schedule when necessary.

Week 1 Orientation
Understanding organizational management (week 2 to 5)
(1) Classical management theories
(2) Management and organizations
(3) Organizational design
(4) Organizational decision-making

Developing corporate strategies (week 6 to 9)
(1) Understanding internal and external environment
(2) Strategic management
(3) Change and innovation
(4) Corporate social responsibility and business ethic

Managing people and team (week 10 to 13)
(1) Human resource management
(2) Team management
(3) Organizational communication
(4) Diversity management

Week 14: Course summary

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Lecture code: H919002
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<td>Field(Classification)</td>
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<td>2018 · Second semester</td>
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<td>For all majors</td>
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### Outline and Purpose of the Course

This course will give an outline of Japanese law. It will explain the outline of constitutional law, substantive and procedural criminal and civil law, as well as enterprise law in Japan, and give an introduction to their basic structure and elements. Along the way, relevant cases decided by Japanese courts will also be discussed. The goal of this course is for students to acquire a basic knowledge of the structure and content of Japanese law. This will help them to further deepen their knowledge of it. An additional goal is for students to get able to analyze legal issues from various angles. During this course, students will be given the opportunity to actively participate in discussions and exchange of ideas.

### Course Goals

- Understanding the outline of the current state and structure of law in modern Japanese society.
- Getting able to analyze legal issues from various angles.

### Course Schedule and Contents

1. Introduction
2. Constitutional Law I: System of government
3. Constitutional Law II: Human rights
4. Criminal Trial
5. Criminal Law I: Crimes and punishments
6. Criminal Law II: Elements of crimes
7. Civil Law I: Juristic acts
8. Civil Law II: Real rights
9. Civil Law III: Contracts
10. Civil Law IV: Torts
11. Civil Law V: Marriage and divorce
12. Civil Law VI: Inheritance
13. Civil Trial
14. Enterprise Law
15. Final exam

Feedback (the method will be explained later)

### Class requirement

None

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

Class attendance and active participation: 20%
Final written examination (part of the questions will have to be answered in the form of a short essay): 80%

### Textbook

Handouts will be distributed and further reading material will be indicated during the course.

### Reference book, etc.

Introduced during class

### Regarding studies out of class (preparation and review)

Will be indicated during the course if necessary.

### Others (office hour, etc.)

Students may contact me by email for appointments or questions regarding the course.
Course title: Contemporary Economics II-E2

Affiliated department: Graduate School of Economics
Program-Specific Associate Professor: Sven Ralph

Group: Humanities and Social Sciences
Language: English

Field (Classification): Jurisprudence, Politics and Economics (Foundations)

Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 · Second semester

Day/period: Thu.3
Target year: All students
Eligible students: For all majors

Number of credits: 2

Course offered year/period: 2018 · Second semester

Course Schedule and Contents:

- Introduction and Definition of Economics
- Principles of Economics
- Adam Smith and the Early History of Macroeconomic Thought
- The Later History of Macroeconomic Thought and the Gross Domestic Product
- Cost of Living and the Inflation Rate
- Unemployment Rate and the Goals of Macroeconomic Policy
- Unemployment
- Growth and Productivity
- Financial System
- Monetary System
- Beyond Growth
- Students' Conference on Selected Macroeconomic Topics
- Students' Conference on Selected Macroeconomic Topics
- Students' Conference on Selected Macroeconomic Topics

Principles of Teaching:

The course uses a problem-oriented approach by confronting students with real-life macroeconomic problems and providing them with macroeconomics' tools to solve these problems. Students' active participation in the class is essential for its success. Lectures will be accompanied by group-works, role plays, small talks throughout the semester.

[Class requirement]

None

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

Class participation: 1/3 each for assignments, presentations, and the final seminar paper

[Textbook]

Mankiw, NG / Taylor, MP "Economics, 2nd revised edition (2011)" (Cengage Learning EMEA)

[Reference book, etc.]


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

- Prepare and review class contents e.g. by textbook readings
- Complete short assignments on a regular basis, prepare presentations, and write a short seminar paper

[Others (office hour, etc.)]

To be announced

Lecture code: H918001
### Course title
Contemporary Economics II-E2

### Affiliated department, Job title
Graduate School of Economics
Program-Specific Associate Professor, Sven Rudolph

### Group
Humanities and Social Sciences

### Field(Classification)
Jurisprudence, Politics and Economics (Foundations)

### Language
English

### Old group
Group A

### Number of credits
2

### Number of weekly time blocks
1

### Class style
Lecture

### Course offered year/period
2018 · Second semester

### Day/period
Thu. 4

### Target year
All students

### Eligible students
For all majors

### Outline and Purpose of the Course
This is an introductory undergraduate course, teaching the fundamentals of modern macroeconomics theory with applications to current economic issues in practice. The course provides students with a solid foundation for macroeconomic analysis and motivates them to engage in further economic studies.

### Course Goals
- knowing the history of economic thought with a focus on macroeconomic thinkers
- understanding the basic principles of economics as a special social science, economic growth, recession/booms, un-/employment, de-/inflation, and the financial system
- applying analytical skills to current macroeconomic problems

### Course Schedule and Contents

<table>
<thead>
<tr>
<th>Content, Outline, Schedule:</th>
<th>The course starts with the basic principles of economics such as methodological individualism and rational behavior. It then gives an introduction to economic history from the economic classics to modern economic theory with a focus on macroeconomic thinkers. It continues with an introduction to macroeconomics' data such as the Gross Domestic Product (GDP) and the Consumer Price Index (CPI). It continues with looking at specific economic problems such as recessions, unemployment, inflation, public debt etc. and ways to deal with these issues. The course finishes with a short treatment the limits to growth and alternatives to the GDP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Introduction and Definition of Economics</td>
<td>2 Principles of Economics</td>
</tr>
<tr>
<td>3 Adam Smith and the Early History of Macroeconomic Thought</td>
<td>4 The Later History of Macroeconomic Thought and the Gross Domestic Product</td>
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<tr>
<td>5 Cost of Living and the Inflation Rate</td>
<td>6 Unemployment Rate and the Goals of Macroeconomic Policy</td>
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<td>7 Unemployment</td>
<td>8 Growth and Productivity</td>
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<td>10 Monetary System</td>
</tr>
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<td>11 Beyond Growth</td>
<td>12 Students' Conference on Selected Macroeconomic Topics</td>
</tr>
<tr>
<td>13 Students' Conference on Selected Macroeconomic Topics</td>
<td>14 Students' Conference on Selected Macroeconomic Topics</td>
</tr>
</tbody>
</table>

### Principles of Teaching:
The course uses a problem-oriented approach by confronting students with real-life macroeconomic problems and providing them with macroeconomics' tools to solve these problems. Students' active participation in the course is essential for its success. Lectures will be accompanied by group-works, role plays, small talks throughout the semester.

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

#### Class participation: 1/3 each for assignments, presentations, and the final seminar paper

### Textbook
Mankiw, NG/Taylor, MP  Economics. 2nd revised edition (2011)  (Cengage Learning EMEA)

### Reference book, etc.

### Regarding studies out of class (preparation and review)
- prepare and review class contents e.g. by textbook readings
- complete short assignments on a regular basis, prepare presentations, and write a short seminar paper

### Others (office hour, etc.)
to be announced

---

Lecture code: H918002

---

Contemporary Economics II-E2(2)
**Course title**
Principles of Economics-E2

**Institute of Economic Research**

**Affiliated department, Job title, Name**
Associate Professor, NEWTON, Jonathan Charles Scott

**Group**
Humanities and Social Sciences

**Field(Classification)**
Jurisprudence, Politics and Economics (Foundations)

**Language**
English

**Number of credits**
2

<table>
<thead>
<tr>
<th>Course title</th>
<th>Course offered year/period</th>
<th>Day/period</th>
<th>Eligible students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles of Economics-E2</td>
<td>2018 - Second semester</td>
<td>Thu.1</td>
<td>For all majors</td>
</tr>
</tbody>
</table>

**Number of weekly time blocks**
1

**Class style**
Lecture

**Target year**
Mainly 1st year students

### [Outline and Purpose of the Course]

This course is an exploration of key economic principles, illustrated and discussed via examples, both quantitative and qualitative, as well as by readings from some of the classic texts of economics.

The purpose of the course is to give students a deep and thoughtful understanding of a few economic concepts, as well as an appreciation of the intellectual history of these concepts.

### [Course Goals]

- To further understanding of important economic concepts.
- To gain an appreciation of the history of thought behind these concepts.
- To be able to consider and apply these concepts in a modern context.

### [Course Schedule and Contents]

Each week we will consider an interesting economic concept. The course will cover some or all of the following 7 topics, each of which will be covered in 2 time blocks (an estimated 3 hours of class time):

1. Self-interest: do free choices make us better off?
2. The Invisible Hand: do free choices make society better off?
3. The marginal theory of value: why are diamonds more expensive than water?
4. Foresight and Ricardian equivalence.
6. Adverse selection and moral hazard.

Readings will be assigned by authors such as Adam Smith, David Ricardo, Thomas Malthus, Alfred Marshall, Carl Menger, Ludwig von Mises, Leon Walras, Vilfredo Pareto, Friedrich Hayek, Ronald Coase.

### [Class requirement]

Students are required to read the assigned texts, attend class and complete assigned questions.

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

Grading will be based on one or more written assignments that will be assessed.

### [Textbook]

Not used

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

Readings assigned in class should be read each week.

### [Others (office hour, etc.)]

Office hours to be announced at first lecture.
The course is an introduction to evolutionary methods in the social sciences, particularly economics and related fields. The goal is to introduce the participants to basic ideas of dynamic strategic adjustment and illustrate how these can be used to understand social norms (e.g. why do people in Tokyo often walk up escalators, but people in Kanazawa almost never walk on escalators, but instead stand still?).

Part of this course considers conventions and can be understood as a quantitative counterpart to the first semester seminar course on conventions, although either of these courses can be taken without the other.

It is recommended that students taking this course are comfortable with studying basic mathematics, preferably having taken at least some course with mathematical/quantitative content while at university.

The purpose of the course is to give students a basic understanding of evolutionary methods that will allow them to analyze problems of social coordination, norms, conventions and social choice.

Course Goals

- To master some basic concepts and quantitative tools of evolutionary game theory.
- To improve critical thinking and consideration of social norms and conventions.
- To prepare students for further analytical work in game theory, economics, sociology or philosophy.

Course Schedule and Contents

Each week part of the textbook or other relevant readings will be covered in class. The course consists of the following 7 topics, each of which will be covered in 2 time blocks (approximately 3 hours of class time):

1. Games and society.
2. Rules of behaviour.
3. Convergence to conventions.
4. The long run emergence of norms.
5. Coordination games, Cournot oligopoly games.
6. Local interaction and population structure.
7. The general structure of an evolutionary model.

Class requirement

Students are required to read the assigned texts, attend class and participate in discussion.

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

Grading will be based on class presentations and discussion of ideas.

[Textbook]


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

The assigned chapters of the textbook, as well as any other readings assigned in class, should be read each week.

[Others (office hour, etc.)]

Office hour by appointment.
<table>
<thead>
<tr>
<th>Course title</th>
<th>Contemporary Management-E2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affiliated department, Job title, Name</td>
<td>Graduate School of Economics, Associate Professor, Yingyan Wang</td>
</tr>
<tr>
<td>Group</td>
<td>Humanities and Social Sciences</td>
</tr>
<tr>
<td>Field (Classification)</td>
<td>Jurisprudence, Politics and Economics (Foundations)</td>
</tr>
<tr>
<td>Language</td>
<td>English</td>
</tr>
<tr>
<td>Old group</td>
<td>Group A</td>
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<tr>
<td>Number of credits</td>
<td>2</td>
</tr>
<tr>
<td>Number of weekly time blocks</td>
<td>1</td>
</tr>
<tr>
<td>Class style</td>
<td>Lecture</td>
</tr>
<tr>
<td>Course offered year/period</td>
<td>2018 · Second semester</td>
</tr>
<tr>
<td>Day/period</td>
<td>Wed.2</td>
</tr>
<tr>
<td>Target year</td>
<td>All students</td>
</tr>
<tr>
<td>Eligible students</td>
<td>For all majors</td>
</tr>
</tbody>
</table>

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

Students will learn and discuss some critical issues in management, including topics such as motivation, leadership, career, and organizational culture. These topics are introduced as the basic concepts relating to people management in the modern business world. In this course, students will read related materials, have discussions about the various theories and concepts mentioned in class, comment on assigned topics as group leaders, and give several simple case presentations.

**[Course Goals]**

Students will read the assigned materials on management and organizational behavior, learn how to present simple cases related to people management, and acquire preliminary skills to understanding everyday issues taking place in the business world.

**[Course Schedule and Contents]**

Students will do extensive reading primarily on the following topics: motivation, leadership, career, and organizational culture. Every week several students will be responsible for the presentation of assigned materials. Further discussion will be held regarding the content of the presentation and related theories or concepts, and a selected leader will present their summary of the group discussion. Students should also prepare for small case presentations related to the four topics of motivation, leadership, career, and organizational culture.

**Week 1 Introduction**

Summary of the main topics covered in the seminar. Students will also be provided with information on purpose and goals of this seminar, how to proceed and prepare for the class, and members of the small group composition.

**Week 2-4 Motivation**

Following a lecture on various basic theories and concepts related to motivation, students will discuss in groups the strengths and weaknesses of different theories, and how to apply these theories to improve motivation for new employees in a small venture business company.

**Week 5-7 Leadership**

Following a lecture on fundamental theories of leadership, students will discuss in groups how to develop leadership in different situations, and give a presentation on a desired leader and how this person has shown strong leadership.

**Week 8-10 Career**

Following a lecture on career theories developed by Edgar Schein, students will discuss in groups about their own career anchors, and give a presentation using their ideas on how to design career paths for themselves or

**Contemporary Management-E2(2)**

for young university graduates in general.

**Week 11-13 Organizational culture**

Following a lecture on three levels of organizational culture and different cultural dimensions, students will discuss in groups the features of organizational culture of an organization they belong to, and give a presentation on the organizational culture of a real company they are interested in.

**Week 14 Review**

**Week 15 Final presentation (or exam)**

Each student will select one of the following topics: motivation, leadership, career, and organizational culture, and present how to improve people management for a company while applying different theories.

**Week 16 Feedback**

**[Class requirement]**

The seminar will be delivered in English. Students should participate in the seminar actively, and be well prepared to discuss with the teacher and other classmates in English regarding the related topics. Knowledge of management is not a requirement to enroll in this seminar.

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

30% class attendance and participation, 30% assignments and 40% final presentation (or exam)

**[Textbook]**

Instructed during class

**[Reference book, etc.]**


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

Students will be expected to spend about at least 90 minutes outside of class each week on preparation, readings, and review.

**[Others (office hour, etc.)]**

Students are welcome to drop by and visit unannounced during regular office hours.
[Outline and Purpose of the Course]

Students will learn and discuss some critical issues in management, including topics such as motivation, leadership, career, and organizational culture. These topics are introduced as the basic concepts relating to people management in the modern business world. In this course, students will read related materials, have discussions about the various theories and concepts mentioned in class, comment on assigned topics as group leaders, and give several simple case presentations.

[Course Goals]

Students will read the assigned materials on management and organizational behavior, learn how to present simple cases related to people management, and acquire preliminary skills to understanding everyday issues taking place in the business world.

[Course Schedule and Contents]

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Summary of the main topics covered in the seminar. Students will also be provided with information on purpose and goals of this seminar, how to proceed and prepare for the class, and members of the small group composition.

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Week 15 Final presentation (or exam)
Each student will select one of the following topics: motivation, leadership, career, and organizational culture, and present how to improve people management for a company while applying different theories.

Week 16 Feedback

[Class requirement]
The seminar will be delivered in English. Students should participate in the seminar actively, and be well prepared to discuss with the teacher and other classmates in English regarding the related topics. Knowledge of management is not a requirement to enroll in this seminar.

[Method, Point of view, and Attainment levels of Evaluation]
30% class attendance and participation, 30% assignments and 40% final presentation (or exam)

[Textbook]
Instructed during class

[Reference book, etc.]
Reference book

[Regarding studies out of class (preparation and review)]
Students will be expected to spend about at least 90 minutes outside of class each week on preparation, readings, and review.

[Others (office hour, etc.)]
Students are welcome to drop by and visit unannounced during regular office hours.
Japan's Political Economy-E2

Course title: Japan's Political Economy-E2
Affiliated department, Job title, Name: Graduate School of Law, Associate Professor, HIJINO KEN

Group: Humanities and Social Sciences
Field(Classification): Jurisprudence, Politics and Economics(Issues)

Language: English
Old group: Group A
Number of credits: 2
Number of weekly time blocks: 1

Class style: Lecture
Course offered year/period: 2018 • First semester
Day/period: Wed.3
Target year: Mostly 1st & 2nd year students
Eligible students: For all majors

[Outline and Purpose of the Course]
This class presents an overview of Japan's post-war modern history and investigates select issues in its political economy. The class is organized into three parts: 1) an overview of Japan's post-war history; 2) an analysis of the politics, economics, society and foreign policy of the country's "lost decades"; and 3) an exploration of Japan's post-war cleavages, ideologies, and place in the world.

[Course Goals]
The goal of this course is for students to begin to contemplate the interactions between politics, economics, society, and foreign policy of a nation over time, i.e. historically. Another goal is for students to improve their English reading and writing skills through studying in English a subject that they may be familiar with in the Japanese language.

[Course Schedule and Contents]
1. Introduction: What is modern history? What is political economy? Why study Japan?

Part one: Japan's post-war history 1945 to 1989
2. Occupation-era Japan: democratization and demilitarization (1945-47)
3. Occupation-era Japan: the "reverse course" and the Yoshida doctrine (1947-51)
4. Post-war economic miracle: economic and social transformations (1952-73)
5. Political struggles and accommodation in the High-growth era (1952-73)

Part two: Japan's lost decades 1990 to 2013
8. The economics of Japan's lost decades: de-regulation and globalization
9. The politics of Japan's lost decades: institutional reform and transition
10. Social transformations during Japan's lost decades: fluidity and insecurity
11. The foreign policy of Japan's lost decades: towards a more "normal" country

Part three: Themes in Japan's post-war political economy (1945-2013)
12. Relations between the centre and periphery in the post-war period
13. Social classes and inequality in the post-war period
14. Political ideologies and cleavages in the post-war period

[Class requirement]
This course does not require any prior knowledge on Japan’s post-war history or political economy. Students will be expected to read about 20-30 pages of rigorous and academic, though not technical, English. Students will also be expected to write their assignments in English (although this may change according to the class level).

[Method, Point of view, and Attainment levels of Evaluation]
Students will be evaluated on short quizzes = 30 % and a final exam = 70 % for their grade.

[Textbook]

[Regarding studies out of class (preparation and review)]
Students will be expected to spend at least 2-3 hours reading and preparing for each class.

[Others (office hour, etc.)]
I will not have fixed office hours, but students may contact me by email for appointments or questions about the course.
Course title: Japanese Politics-E2
Affiliated department, Job title, Name: Graduate School of Law, Associate Professor, HIJINO KEN

Group: Humanities and Social Sciences
Field(Classification): Jurisprudence, Politics and Economics(Issues)
Language: English
Old group: Group A
Number of credits: 2
Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • First semester
Day/period: Thu. 1
Target year: 2nd year students or above
Eligible students: For all majors

(Students of Faculty of Law cannot take this course as liberal arts and general education course. Please register the course with your department.)

[Outline and Purpose of the Course]
This is an introductory course on Japanese politics which considers the nature of Japan's political institutions from a comparative perspective. The course will analyze how variation in key political institutions (such as the electoral system) affects political outcomes in Japan and other democracies. The course is organized into three parts: 1) a brief survey of Japanese political history from the Meiji era to the present 2) a description and comparison of Japan's key political institutions 3) investigation into a number of political themes in post-war Japan.

Along the way, students are introduced to basic social science methodologies of comparison to generate causal inferences as well as some basic analytical models used in comparative politics (such as the principal-agent and veto player model).

[Course Goals]
The goal of this course is for students to begin to contemplate how the preferences of voters, politicians, parties and interest groups are constrained and channeled by political institutions. Another goal is for students to improve their English reading and writing skills through studying in English a subject that they may be familiar with in the Japanese language.

[Course Schedule and Contents]
1. Introduction: What is politics? What are political institutions? Why compare?
   Part one: An overview of Japan's political history
   2. Pre-war politics: the Meiji constitution and politics of oligarchy (1889-1945)
   3. The Occupation era: the post-war constitution and democratization (1945-51)

   Part two: Japan's political institutions in comparative perspective
   6. Electoral rules: majoritarian and proportional systems
   7. The party system: party types, numbers, and issue cleavages
   8. Electoral campaigns: watch documentary "Campaign"
   9. Chief executives and leadership: prime ministers and presidents
   10. The bureaucracy: principal-agent model and the autonomy of bureaucracy
   11. The local government system: decentralization and local government autonomy
   12. Institutional veto players: bicameralism, constitutionalism, and judiciary

   Part three: Themes in Japanese politics
   (Students of Faculty of Law cannot take this course as liberal arts and general education course. Please register the course with your department.)

[Class requirement]
Previous knowledge in Japanese politics, social sciences or political science will not be required for this class. Students will also be expected to write their assignments in English (although this may change according to the class level).

[Method, Point of view, and Attainment levels of Evaluation]
Students will be evaluated on pop quizzes = 30% and a final examination = 70% for their grade.

[Textbook]

[Reference book, etc.]

[Regarding studies out of class (preparation and review)]
Students will be expected to read and prepare for at least 2-3 hours per class each week.

[Others (office hour, etc.)]
I will not have fixed office hours, but students may contact me by email for appointments or questions about the course.

Japanese Politics-E2(2)

14. Demography: aging and youth in politics

Lecture code: H929001
This is a small-sized seminar-type class for students wishing to learn how to read critically in English by reading texts from leading scholars and commentators on modern democracy. The class will introduce key issues surrounding democracy, including its history, definition, limits, and current challenges.

We will be reading articles in journals and papers such as Foreign Affairs, New York Review of Books, the Economist, and the Guardian on ongoing topics relating to the health of democracy such as populism, inequality, social media, and illiberalism.

You do not need to have prior knowledge in political science or social sciences, or be a native English speaker/writer to join this seminar.

The goal of this seminar is for students to learn how to critically read and evaluate the theoretical arguments and empirical evidence provided in the very best of political science literature. Such an intense reading should train non-native English speakers to improve both their English reading and comprehension, but also their engagement with academic texts in other languages. Students are expected to be active in presenting and formulating their ideas during the course, giving them opportunity to improve their output in English.

Each class will involve a student presentation of the reading assignment (20 pages or so) and an in-class discussion of the text. The texts that will be read will be determined according to student interest and capacity at the beginning of the term.

Students will be evaluated on their participation in class discussion, class presentations and weekly reading reports, and a final term paper (2,000 words) – each worth approximately a third of their grade.

Students will need to spend at least 3 hours a week, reading and preparing for discussion of the text.
**Introduction to European Law-E2(2)**

**Feed back (method will be explained later)**

**[Class requirement]**
As the course requires a certain level of knowledge of academic English, it is addressed to students of second year and above.

**[Method, Point of view, and Attainment levels of Evaluation]**
Students will be evaluated on the basis of a final written exam. Part of the exam questions will have to been answered in the form of a short essay.

**[Textbook]**
Lecture materials and indication of further reading might be provided in class.

**[Reference book, etc.]**
Introduced during class

**[Regarding studies out of class (preparation and review)]**
Will be indicated in class if necessary.

**[Others (office hour, etc.)]**
Students may contact me by email for appointments or questions regarding the course.

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**Introduction to European Law-E2**

<table>
<thead>
<tr>
<th>Course title</th>
<th>Affiliated department, Job title, Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to European Law-E2</td>
<td>Graduate School of Law, Associate Professor, KARAISKOS, Antonios</td>
</tr>
</tbody>
</table>

**Group**
- Humanities and Social Sciences
- Jurisprudence, Politics and Economics (Issues)

**Language**
- English

**Old group, Group A**

**Number of weekly time blocks**
- 1

**Class style**
- Lecture

**Course offered year/period**
- 2018 • First semester

**Day/period**
- Fri. 3

**Eligible students**
- For all majors

(Students of Faculty of Law cannot take this course as liberal arts and general education course. Please register the course with your department.)

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

European law has many aspects. On the one hand, there are the various European states, each with their own legal system and legal tradition. On the other hand, the European Union has become an important factor in European politics, economy, and also law. Further, there are various projects which aim at harmonizing law in Europe.

This course will give an overview of the various aspects of European law. Therefore, the first part of the course will give an introduction to the European Union, its history and legal framework. The second part will give an overview of the various European legal systems, their differences and what we can learn from comparative law studies. The third and final part will look at efforts in the harmonization and unification of law in Europe with a focus on private law.

The course will give students ample opportunity to actively participate in discussions and case-solving. This course is thus helpful both for students who want to learn more about the European Union and integration in Europe from a legal perspective, as well as for students who intend to study any of the national laws of European states which today are closely interconnected with European Union law.

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**[Course Goals]**

- Getting to know the European Union, its history, structure, and legal framework.
- Learning about various European legal systems, their differences and what they have in common.
- Getting familiar with comparative law and its methods.
- Becoming able to discussing the benefits and problems of the harmonization of laws.

---

**[Course Schedule and Contents]**

1. Introduction
2. What is European Law?
3. European Union I: Historical overview
4. European Union II: Institutions
5. European Union III: Decision-making process, legislative procedures
6. European Union IV: Competences, supremacy of EU law
7. European Union V: EU citizenship, non-discrimination, basic freedoms
8. European Union VI: Transformation and application of EU law
9. European Union VII: Interpretation of EU law - the European Court of Justice
10. European Union VIII: Example - EU consumer protection law
11. Private law systems in Europe I: Legal families and common historical roots
12. Private law systems in Europe II: Comparative law in Europe
13. Harmonization of laws within Europe I: Benefits and costs
14. Harmonization of laws within Europe II: Methods and Various Projects
15. Final exam

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Lecture code: H930001
**Course title**
Mathematical Description of Natural Phenomena

**Affiliated department, Job title, Name**
Graduate School of Engineering
Senior Lecturer, Chang, Kai-Chun

**Group**
Natural Sciences

**Field(Classification)**
Mathematics(Foundations)

**Language**
English

**Number of weekly time blocks**
1

**Class style**
Lecture

**Course offered year/period**
2018 • First semester

**Number of credits**
2

**Day/period**
Tue. 3

**Target year**
Mainly 1st year students

**Eligible students**
For science students

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

One of the major reasons of providing this course is the noticeable gap between high school mathematics and college mathematics. The gap has led to a marked decline in the students' ability not only to grasp physical phenomena observed in engineering disciplines but also to explain principles behind the phenomena - e.g. to describe and analyze natural phenomena by means of differential equations. This course aims at bridging the gap between high school mathematics and college mathematics. Through this course, students learn how the physical phenomena in engineering disciplines - e.g. vibration of a structure, wave propagation, fluid dynamics and so on - are described in differential equations. They also learn how those physical phenomena are solved by differential equations.

**[Course Goals]**

- To understand the relationship between scientific observation and mathematics.
- To understand how the physical phenomena in engineering disciplines are described in differential equations, as well as how to solve them.

**[Course Schedule and Contents]**

- To achieve the goal, this lecture will cover the following topics.
  1. Picture of Calculus, basics of differentiation and integration
  2. e, the basis of the natural logarithm
  3. Complex numbers, exponential function, logarithmic function and trigonometric functions
  4. Differential equations and physical phenomena modelling

- The lecture is designed to cover following topics, in detail.
  1. Introduction
    - Describing phenomena, input-output system model, etc. [2 weeks]
  2. Basics of Calculus
    - Picture of Calculus, derivatives, basic rules, chain rule, implicit differentiation, inverse functions and their derivatives, etc. [4 weeks]
    - Exponential and logarithmic functions, their derivatives, characterizations of exponential functions, etc. [2 weeks]
  3. Differential equations and phenomenon descriptions
    - Radioactive decay, population growth/decay, mixed growth/decay [3 weeks]
    - Spring problems, equations of motion, simple harmonic motions, damped vibrations, etc. [3 weeks]

**[Class requirement]**
None

**[Method, Point of view, and Attainment levels of Evaluation]**
Quizzes and exercises (50%) and final examination (50%)

**[Textbook]**
Instructed during class
Handouts distributed in class or uploaded to PandA

**[Reference book, etc.]**

- G. Strang 'Calculus, 2nd ed.' (Wellesley-Cambridge Press)
- W.F. Trench 'Elementary Differential Equations' (Brooks/Cole)

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

Students are expected to spend at least 2 hours on this course for preview and review. More than half of that time is spent preparing for class and doing assignments.

**[Others (office hour, etc.)]**

Any inquiry to the instructor: chang.kaichun.4z@kyoto-u.ac.jp (replace {at} with @)
<table>
<thead>
<tr>
<th>Course title</th>
<th>&lt;English&gt; Linear Algebra with Exercises A &lt;English&gt; Linear Algebra with Exercises A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affiliated department</td>
<td>Graduate School of Science</td>
</tr>
<tr>
<td>Job title, Name</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Name</td>
<td>BENOIT VINCENT PIETRO</td>
</tr>
<tr>
<td>Group</td>
<td>Natural Sciences</td>
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<tr>
<td>Field(Classification)</td>
<td>Mathematics(Foundations)</td>
</tr>
<tr>
<td>Language</td>
<td>English</td>
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<tr>
<td>Old group</td>
<td>Group B</td>
</tr>
<tr>
<td>Number of weekly time blocks</td>
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</tr>
<tr>
<td>Class style</td>
<td>Lecture</td>
</tr>
<tr>
<td>Course offered year/period</td>
<td>2018 · First semester</td>
</tr>
<tr>
<td>Day/period</td>
<td>Mon.3 · Tue.2</td>
</tr>
<tr>
<td>Target year</td>
<td>Mainly 1st year students</td>
</tr>
<tr>
<td>Eligible students</td>
<td>For science students</td>
</tr>
<tr>
<td>Number of credits</td>
<td>3</td>
</tr>
</tbody>
</table>

### [Outline and Purpose of the Course]

Calculus and linear algebra form the essential mathematical background necessary for understanding and developing modern science and technology. In this lecture, basics of Linear Algebra required for further pursuing of studies majored in science are explained.

In the Linear Algebra A class, students will learn to manipulate concretely vectors, matrices, and systems of linear equations.

### [Course Goals]

The goal of this class is to learn to manipulate concretely vectors, matrices, and systems of linear equations. In addition to learning linear algebra, students can learn how to discuss and present mathematical topics in English through this course.

### [Course Schedule and Contents]

This subject is composed of two interrelated parts: Lecture and Exercises. The exercises sessions will take place basically once in two weeks, their purpose being to deepen the students' understanding of the contents of the lecture sessions through active participation in problem solving and through regular submission of reports.

In the course outline below, the order in which the given items will be presented is not fixed and depends on the background and understanding of enrollees.

1. Fundamental concepts (1 week)
   - numbers, sets, mappings, basic notions of mathematical logic
2. Vectors in the plane and 2x2 matrices (2 weeks)
   - matrix and vector calculus, matrix inverses, Cayley Hamilton theorem
   - linear transformations of the plane (rotation, reflections, etc) and matrices
   - linear systems of equations and matrices
3. Concrete vector spaces and matrices (5-7 weeks)
   - vectors, vector calculus, linear span
   - matrices, matrix calculus (addition, scalar product, product)
   - elementary operations on matrices, rank, invertible matrices, inverse matrix
4. Determinant (4-6 weeks)
   - row/column substitution and signature; definition of determinant and properties (3-4 weeks)
   - computation of determinant, Cramer's rule, volume and determinant (1-2 weeks)

---

**Linear Algebra with Exercises A(2)**

**[Class requirement]**

None

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

Students will be evaluated based on their performance in both the lecture and the exercises sessions.

* Lecture will be graded based mainly on the final examination.
* Exercises will be evaluated based mainly on submitted reports and participation in class.

The details of the evaluation system will be given by the lecturer at the first lecture.

Students who fail to pass the examination but reach a certain standard are eligible for reexamination.

**[Textbook]**

Not used

**[Reference book, etc.]**

Jim Hefferon 《Linear Algebra and Its Applications》
This text is Free, either the GNU Free Documentation License or the Creative Commons License Creative Commons Attribution-ShareAlike 2.5 License.
Website: http://joshua.smcvt.edu/linearalgebra/

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

To be announced.

**[Others (office hour, etc.)]**

It is advisable to attend the lecture “Calculus with Exercises A” in parallel.
Moreover, it is recommended to register for "Linear Algebra with Exercises B" in the second semester.

Students are welcome to ask questions during, at the beginning or at the end of the class.
The instructor encourages students to arrange an appointment with him if they have questions.

---

Lecture code: N159001
Course title: Quest for Mathematics I-E2

Affiliated department, Job title, Name: Graduate School of Informatics Program-Specific Associate Professor, David Croydon

Group: Natural Sciences
Field (Classification): Mathematics (Foundations)
Language: English
Old group: Group B
Number of credits: 2

Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • First semester
Day/period: Fri. 2
Target year: Mainly 1st & 2nd year students
Eligible students: For liberal arts students

[Outline and Purpose of the Course]
This class aims at introduction of calculus for those who did not study "Mathematics III (of the Japanese high school standard)".

[Course Goals]
The goal of the class is to solve problems of the same level with those in entrance examination for science students. An additional goal of this course is to give a chance to the students to present and discuss mathematics in English.

[Course Schedule and Contents]
The course will cover the following topics, and each of them is read in 3-4 weeks:
1. Limit of series and continuous functions
2. Differentiation of elementary functions (i.e. sine, cosine, exponential etc.)
3. Brief introduction of the Riemann integral and differential equations
4. Applications.

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
The evaluation of the course will take into account the following criteria:
- homework (20%)
- presentation (10%)
- final exam (70%)

[Textbook]
Not used

[Reference book, etc.]
Reference book:
Thomas 'Calculus' (Pearson)

[Regarding studies out of class (preparation and review)]
Exercises are given in class and students are required to solve them for clear understanding of the topics in class.

[Others (office hour, etc.)]
High school text book "Mathematics III (高等学校 数学 III)" based on the Japanese high school standard is useful to understand of the subject of the class.
Office hours are not assigned and it is advisable to make comments willingly during and after the class.

Lecture code: N174001
.calculus and linear algebra form the essential mathematical background necessary for understanding and developing modern science and technology. in this lecture, basics of calculus required for further pursuing of studies majored in science are explained. calculus with exercises a strengthens the theoretical base of high school knowledge of differentiation and integration for real functions of one variable, and provides instructions on other more advanced methods of mathematical analysis.

[course goals]
the objective of this course is to learn and understand basic notions of differentiation and integration of functions of one variable and methods of mathematical analysis based on them, as well as to become able to apply this knowledge to solving problems. in addition to learning the basic calculus, students can learn through this course how to discuss and present mathematical topics in english.

[course schedule and contents]
this subject is composed of two interrelated parts: lecture and exercises. the exercises sessions will take place basically once in two weeks, their purpose being to deepen the students' understanding of the contents of the lecture sessions through active participation in problem solving and through regular submission of reports.

in the course outline below, the order in which the given items will be presented is not fixed and depends on the background and understanding of the enrollees.

1. fundamental concepts (1 week)
numbers, sets, mappings, basic notions of mathematical logic.
2. properties of real numbers and continuous functions (3-4 weeks)
infinum and supremum of sets of real numbers, convergence of sequences, infinite series, limits of functions, definition and basic properties of continuous functions (intermediate value theorem, etc.).
3. differentiation of functions of one variable (4-5 weeks)
differential coefficients, derivative, differentiation of composite functions and inverse functions, derivatives of higher order, taylor expansion, the mean-value theorem and its applications (monotonicity, convexity, extrema), infinitesimals, calculation of approximations*. 4. integration of functions of one variable (3-4 weeks)
riemann integral, integrability of continuous functions, definite integrals, the fundamental theorem of calculus, integration by parts and by substitution, improper integrals, length of curve*.

reference books:

- a. m. bruckner, j. b. bruckner, b. s. thomson "elementary real analysis," (this book can be downloaded for free at http://classicalrealanalysis.info/free-downloads.php )
- m. spivak "calculus," (publish or perish) isbn: 978-0914098911
- n. l. carothers "real analysis," (cambridge university press) isbn: 978-0521497565
- e. hewitt, k. stromberg "real and abstract analysis," (springer) isbn: 978-0387901381

regarding studies out of class (preparation and review)

it is difficult to follow the lecture without regular study. therefore, students are expected to devote an amount of time equivalent to the time of the lecture to solve report problems and to review the contents of previous lectures.

others (office hour, etc.)

it is advisable to attend the lecture "linear algebra with exercises a" in parallel. moreover, it is recommended to register for "calculus with exercises b" in the second semester.

there are no fixed office hours. if you wish to have a consultation, please feel free to contact the lecturer.
Course title: Quest for Mathematics II-E2
Affiliated department: Research Institute for Mathematical Sciences
Job title: Senior Lecturer
Name: TAN, Fucheng
Group: Natural Sciences
Field (Classification): Mathematics (Foundations)
Language: English
Number of weekly time blocks: 1
Number of credits: 2
Course offered year/period: 2018 • First semester
Day/period: Wed. 4
Target year: Mainly 2nd year students or above
Eligible students: For all majors

Outline and Purpose of the Course

Calculus/Mathematical Analysis and Linear Algebra form the basis of mathematics to support science and technology. Assumed to have basic knowledge in at least one of them, students will concentrate on improving communication and discussion skills in English for related mathematical topics.

Course Goals

By reviewing calculus/mathematical analysis and linear algebra (and possibly other suitable topics in mathematics) in English, with emphasis on oral communication, students are expected to be able to present mathematics and discuss with others in English efficiently.

Course Schedule and Contents

The course is designed to improve students' ability of expressing mathematics in English. This will be done during the process of reviewing various mathematical topics (mainly in calculus and linear algebra), by the students. The instructor will provide corrections and comments on students' presentations. Depending on the number of students and their backgrounds, each student may give 3-7 presentations during the semester.

Below is the contents of the course, hence the topics of students' presentations. The presentations, as well as their order, may be modified, depending on students' backgrounds and understanding of the course materials. A student is allowed to suggest other topics, provided these topics are also suitable for other students.

1. Limits: Convergent sequences, Cauchy sequences, infinite series, absolute convergence.
2. Continuity: Limits of functions, continuous functions, intermediate value theorem.
3. Differentiation: Derivatives, mean value theorem, differentiation formulas, optimization problems, L'Hospital's rule, Taylor's theorem.
4. Integration: Riemann integral, fundamental theorem of calculus, substitution method, area and volume problems.
5. Uniform convergence: Uniform convergence and continuity, uniform convergence and integration, uniform convergence and differentiation, Stone-Weierstrass theorem.
6. Functions of several variables:

Class requirement

Students are supposed to know basics in Calculus and/or Linear algebra. It is helpful to know both, but not required.

Method, Point of view, and Attainment levels of Evaluation

The evaluation consists of three weighted parts:

1. Discussion performance in class (20%).
2. Two-six in-class presentations (40%): Each student reviews some mathematical topics assigned by the instructor. It is also possible that a student choose their own topics, with the instructor’s approval.
3. Final presentation (40%): Each student reviews one mathematical topics assigned by the instructor. It is also possible that a student choose their own topic, with the instructor’s approval.
<table>
<thead>
<tr>
<th>Quest for Mathematics II-E2(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Textbook</strong></td>
</tr>
<tr>
<td><strong>Reference book, etc.</strong></td>
</tr>
<tr>
<td>The video lectures from MIT OpenCourseWare (<a href="https://ocw.mit.edu/index.htm">https://ocw.mit.edu/index.htm</a>) are highly recommended. Other supplemental materials will be introduced during the classes.</td>
</tr>
<tr>
<td><strong>Regarding studies out of class (preparation and review)</strong></td>
</tr>
<tr>
<td>Along with preparation and review, students are encouraged to form study groups.</td>
</tr>
<tr>
<td><strong>Others (office hour, etc.)</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Course title &lt;English&gt;</th>
<th>Linear Algebra with Exercises B(2)</th>
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</thead>
<tbody>
<tr>
<td>[Textbook]</td>
<td>Not used</td>
</tr>
<tr>
<td>[Reference book, etc.]</td>
<td>David C. Lay 『Linear Algebra and Its Applications』 (Addison-Wesley) 3rd or 4th edition</td>
</tr>
<tr>
<td>[Regarding studies out of class (preparation and review)]</td>
<td>To be announced.</td>
</tr>
<tr>
<td>[Others (office hour, etc.)]</td>
<td>It is advisable to attend the lecture “Calculus with Exercises B” in parallel. Students are welcome to ask questions during, at the beginning or at the end of the class. The instructor encourages students to arrange an appointment with him if they have questions.</td>
</tr>
</tbody>
</table>

**Course title**
- Linear Algebra with Exercises B(2)

**Affiliated department, Job title, Name**
Graduate School of Science  Associate Professor, UOLLNS, Benoit Vincent Pierre

**Group**
- Natural Sciences

**Language**
- English

**Number of weekly time blocks**
- 2

**Class style**
- Lecture

**Course offered year/period**
- 2018 • Second semester

**Day/period**
- Mon.3 • Tue.2

**Target year**
- Mainly 1st year students

**Eligible students**
- For science students

**Number of credits**
- 3

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### [Outline and Purpose of the Course]

Linear algebra is one of the fundamental and important parts of mathematics. With Linear Algebra A and B, students are expected to understand not only the fundamental concepts of vector spaces and linear mappings, but also the concrete treatments of matrices and systems of linear equations.

### [Course Goals]

The objective of this course is to introduce linear algebra concepts such as vector spaces, linear mappings, matrices and systems of linear equations. In addition to learning linear algebra, students can learn how to discuss and present mathematical topics in English through this course.

### [Course Schedule and Contents]

1. Abstract Vector spaces
   - (1—3) Basis, dimension, linear mappings and matrices,
   - (4—5) change of bases, subspaces, direct sums, kernel and image

2. Euclidean Spaces
   - (6—7) Inner product, orthogonal matrices, unitary matrices,
   - (8—10) orthonormal basis and orthogonal complements

3. Eigenvalues and diagonalization of matrices
   - (11—12) Eigenvalues and eigenvectors, eigenpolynomials,
   - (13—14) diagonalization of symmetric matrices by orthogonal matrices (diagonalization of Hermitian matrices by unitary matrices)

### [Class requirement]

Students are expected to understand Calculus with Exercises A and Linear Algebra with Exercises A.

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

Students will be evaluated based on their performance in both the lecture and the exercises sessions.

* Lecture will be graded based mainly on the final examination.
* Exercises will be evaluated based mainly on submitted reports and participation in class.

The details of the evaluation system will be given by the lecturer at the first lecture. Students who fail to pass the examination but reach a certain standard are eligible for reexamination.

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Lecture code: N160001
Course title: Quest for Mathematics I-E2

Affiliated department: Graduate School of Informatics

Program: Specific Associate Professor, David Croydon

Group: Natural Sciences

Field (Classification): Mathematics (Foundations)

Language: English

Group: B

Number of weekly time blocks: 1

Class style: Lecture

Course offered year/period: 2018, Second semester

Day/period: Fri. 2

Number of credits: 2

Eligible students: For liberal arts students

Target year: Mainly 1st & 2nd year students

[Outline and Purpose of the Course]

This class aims at introduction of calculus for those who did not study "Mathematics III (of the Japanese high school standard)".

[Course Goals]

The goal of the class is to solve problems of the same level with those in entrance examination for science students. An additional goal of this course is to give a chance to the students to present and discuss mathematics in English.

[Course Schedule and Contents]

The course will cover the following topics, and each of them is read in 3-4 weeks:
1. Limit of series and continuous functions
2. Differentiation of elementary functions (i.e. sine, cosine, exponential etc.)
3. Brief introduction of the Riemann integral and differential equations
4. Applications.

[Class requirement]

None

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

The evaluation of the course will take into account the following criteria:
- Homework (20%)
- Presentation (10%)
- Final exam (70%)

[Textbook]

Not used

[Reference book, etc.]

(Reference book)
Thomas 'Calculus' (Pearson)

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

Exercises are given in class and students are required to solve them for clear understanding of the topics in class.

[Others (office hour, etc.)]

High school text book "Mathematics III (高等学校 数学 III)" based on the Japanese high school standard is useful to understand of the subject of the class.

Office hours are not assigned and it is advisable to make comments willingly during and after the class.
### Outline and Purpose of the Course

Calculus and linear algebra form the essential mathematical background necessary for understanding and developing modern science and technology. In this lecture, basics of calculus required for further pursuing of studies major in science are explained.

The course Calculus with Exercises B, after providing some more topics on functions of one variable that were not mentioned in "Calculus with Exercises A", explains differentiation and integration of functions of several variables.

### Course Goals

The objective of this course is to learn and understand basic notions of differentiation and integration of functions of one and several variables and methods of mathematical analysis based on them, as well as to become able to apply this knowledge to solving problems.

In addition to mastering the basic calculus, students can learn through this course how to discuss and present mathematical topics in English.

### Course Schedule and Contents

This subject is composed of two interrelated parts: Lecture and Exercises. The exercises sessions will take place basically once in two weeks, their purpose being to deepen the students’ understanding of the contents of the lecture sessions through active participation in problem solving and through regular submission of reports.

In the course outline below, the order in which the given items will be presented is not fixed and depends on the background and understanding of the enrollees.

1. Series and sequences of functions (3-4 weeks)
   - Infinite series (convergence criteria, absolute and conditional convergence), power series (radius of convergence, termwise differentiation and integration), sequences and series of functions (uniform convergence, termwise differentiation and integration).
2. Sets of points in a plane and in space (2-3 weeks)
   - Distance, convergence of sequences of points, open sets, closed sets, properties of continuous functions.
3. Differentiation of functions of several variables (4-5 weeks)
   - Partial differential coefficients, total differentiability, tangential plane, gradient vector, differentiation of composite functions (chain rule), Jacobian matrix and determinant, implicit functions, inverse mapping, Taylor's formula, extreme value problems, extreme value problems with constraints.
4. Integration of functions of several variables (4-5 weeks)
   - Multiple integrals, iterated integrals, calculation of area and volume, change of variables for multiple integrals, improper integrals.

### Class requirement

Students must attend the course "Calculus with Exercises A" before taking "Calculus with Exercises B". Moreover, students are expected to have mastered the contents of the course "Linear Algebra with Exercises A".

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

Students will be evaluated based on their performance in both the lecture and the exercises sessions.

* Lecture will be graded based mainly on the final examination.
* Exercises will be evaluated based on submitted reports and participation in class.

The details of the evaluation system will be given by the lecturer at the first lecture.

Students who fail to pass the examination but reach a certain standard are eligible for reexamination.

### Textbook

Textbook will be announced at the lecture.

### Reference book, etc.


### Regarding studies out of class (preparation and review)

It is difficult to follow the lecture without regular study. Therefore, students are expected to devote an amount of time equivalent to the time of the lecture to solve report problems and to review the contents of previous lectures.

### Others (office hour, etc.)

It is desirable to take the course "Linear Algebra with Exercises B" in parallel.

There are no fixed office hours. If you wish to have a consultation, please feel free to contact the lecturer.
[Outline and Purpose of the Course]

Calculus/Mathematical Analysis and Linear Algebra form the basis of mathematics to support science and technology. Assumed to have basic knowledge in at least one of them, students will concentrate on improving communication and discussion skills in English for related mathematical topics.

[Course Goals]

By reviewing calculus/mathematical analysis and linear algebra (and possibly other suitable topics in mathematics) in English, with emphasis on oral communication, students are expected to be able to present mathematics and discuss with others in English efficiently.

[Course Schedule and Contents]

The course is designed to improve students' ability of expressing mathematics in English. This will be done during the process of reviewing various mathematical topics (mainly in calculus and linear algebra), by the students. The instructor will provide corrections and comments on students' presentations. Depending on the number of students and their backgrounds, each student may give 3-7 presentations during the semester.

Below is the contents of the course, hence the topics of students’ presentations. The presentations, as well as their order, may be modified, depending on students’ backgrounds and understanding of the course materials. A student is allowed to suggest other topics, provided these topics are also suitable for other students.

1. Limits: Convergent sequences, Cauchy sequences, infinite series, absolute convergence.
2. Continuity: Limits of functions, Cauchy sequences, intermediate value theorem.
4. Integration: Riemann integral, fundamental theorem of calculus, substitution method, area and volume problems.
5. Uniform convergence: Uniform convergence and continuity, uniform convergence and integration, uniform convergence and differentiation, Stone-Weierstrass theorem.
6. Functions of several variables: Linear transformations, the contraction principle, inverse function theorem, implicit function theorem.
9. Vector spaces and subspaces: Definition of a vector space, complete solutions to a linear equation, the four subspaces associated to A, basis and dimension.
10. Orthogonality: Fundamental theorem of linear algebra (on orthogonal complements of the four subspaces), least square approximation, Gram-Schmidt.
11. Determinants: The characterizing properties of determinants, the cofactor formula, Cramer's rule, determinants and volumes.
12. Eigenvalues and eigenvectors: Eigenvalues and determinant, eigenvalues and trace, diagonalization, symmetric matrices.
13. Singular value decomposition: "How does SVD tell us that every real symmetric matrix is diagonalizable?", the pseudo-inverse and least squares with dependent columns.
14. Linear transformations: Examples of linear transformations, a matrix of linear transformation, the change of basis matrices.
15. Complex matrices: Complex conjugation, complex inner products, eigenvalues of a Hermitian matrix, eigenvalues of a unitary or orthogonal matrix.

[Class requirement]

Students are supposed to know basics in Calculus and/or Linear Algebra. It is helpful to know both, but not required.

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

The evaluation consists of three weighted parts:

1. Discussion performance in class (20%).
2. Two-six in-class presentations (40%): Each student reviews some mathematical topics assigned by the instructor. It is also possible that a student choose their own topics, with the instructor's approval.
3. Final presentation (40%): Each student reviews one mathematical topics assigned by the instructor. It is also possible that a student choose their own topic, with the instructor's approval.
### Textbook

- **Walter Rudin**  
  "Principles of Mathematical Analysis."
  (McGraw-Hill Education; 3rd edition)  
  ISBN: 978-0070542358

- **Sheldon Axler**  
  "Linear Algebra Done Right."
  (Springer; 3rd ed. 2015 edition)  
  ISBN: 978-3319110790
  
  (E-version available at https://kuline.kulib.kyoto-u.ac.jp)

### Reference book, etc.

- **Sheldon Axler**  
  "Linear Algebra Done Right."
  (3rd edition)

### Regarding studies out of class (preparation and review)

Along with preparation and review, students are encouraged to form study groups.

### Others (office hour, etc.)
Advanced Linear Algebra

Lecture code: N106001

Course title: Advanced Linear Algebra

Affiliated department: Graduate School of Engineering
Job title: Senior Lecturer
Name: Chang, Kai-Chun

Group: Natural Sciences
Field/Classification: Mathematics (Development)

Language: English
Old group: Group B
Number of credits: 2

Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • First semester

Day/period: Fri. 2
Target year: 2nd year students or above
Eligible students: For science students

Outline and Purpose of the Course
This course discusses advanced concepts of linear algebra, such as orthogonality, diagonalization, Singular Value Decomposition (SVD) of a matrix, and their applications to real-world problems, etc.

Course Goals
- To acquire the advanced concepts of linear algebra, such as orthogonality, diagonalization, SVD of matrix.
- To understand the applications of linear algebra to real-world problems.

Course Schedule and Contents
1. Review of linear algebra [1 week]
   - Big picture, rank, dimension, LU/LDU factorization, Gauss-Jordan elimination, etc.
2. Vector spaces and subspaces [3 weeks]
   - Vector spaces, subspaces, nullspace, complete solutions, four subspaces and their dimensions and orthogonality, etc.
3. Orthogonality and its applications [4 weeks]
   - Orthogonality and orthogonality complement, projections, least square approximations, orthogonal bases, Gram-Schmidt process, etc.
4. Eigenvalues, eigenvectors, and their applications [4 weeks]
   - Eigenvalues and eigenvectors, diagonalization, matrix power, singular value decomposition (SVD), and their application to difference equations, differential equations, and Markov process, etc.
5. Optional topics [2 weeks]
   - Numerical solutions, complex vectors and matrices, other applications, etc.

Class Requirement
Suggested prerequisites: Calculus A/B and Linear Algebra A/B or Calculus with Exercises A/B and Linear Algebra with Exercises A/B

Method, Point of view, and Attainment levels of Evaluation
Quizzes or assignments (50%); final examination (50%)

Textbook
Instructed during class

Reference book, etc.
(Reference book)

Regarding studies out of class (preparation and review)
Students are expected to spend at least 2 hours per week on preview and review. More than half of that time is spent preparing for class and doing assignments.

Others (office hour, etc.)
Any inquiry to the instructor: chang.kaichun.4z@kyoto-u.ac.jp (replace {at} with @)
Honors Mathematics B-E2

[Class requirement]
Calculus A, B and Linear Algebra A, B.
Familiarity with materials covered in Honors Mathematics A may be helpful.

[Method, Point of view, and Attainment levels of Evaluation]
The evaluation of the course will take into account the following criteria:
(1) homework and presentation of students during the course (about 20%)
(2) tests & midterms (about 20%)
(3) final exam (about 60%)
Details will be discussed with students during the first classes.

[Textbook]
Not fixed

[Reference book, etc.]
Introduced during class

[Regarding studies out of class (preparation and review)]
As in every math course, students should read notes carefully and repeatedly after the class, solve exercise problems and try to find alternative proofs, counterexamples, etc.
After many hours of such practice you may get an intuitive understanding of the materials covered.

[Others (office hour, etc.)]
Students are welcome to ask questions during or at the end of the class.
The schedule of office hours will be announced later.

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This course provides opportunities to learn mathematics in depth for highly motivated students. It supplements Calculus B and Linear Algebra B, and treats more advanced related topics. Students can also learn how to discuss and present mathematical topics in English through this course.

One of the goals of this course is to help students to get used to rigorous proofs of mathematical statements and abstract notions in mathematics. These two features are central to and represent the power of modern mathematics, because rigorously proven facts are true forever, and an abstract notion is applicable to various different situations as far as they share one key property.

If the number of students permits, the course will be interactive. In particular, an additional goal of this course is to give a chance for the students to discuss mathematics in English.

Topics will be chosen according to the level of the students. Details will be explained during class. Below is a list of themes that may be covered:

1. Groups (tentatively 7 weeks)
   1.1 definition
   1.2 examples: symmetric and alternating groups, Lie groups.
   1.3 representations

2. Orthogonal functions and Fourier series (tentatively 7 weeks)
   2.1 inner product in a space of functions and orthonormal system of functions
   2.2 orthogonal polynomials
   2.3 space of continuous functions on the circle and its completion
   2.4 Fourier series
   2.5 notions of convergence of the Fourier series
   2.6 Fourier series and Fourier transform

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Lecture code: N165001
Course title: Function Theory of a Complex Variable-E2

Affiliated department, Job title, Name: Graduate School of Informatics, Program-Specific Associate Professor, David Croydon

Group: Natural Sciences
Field(Classification): Mathematics(Development)

Language: English
Old group: Group B
Number of weekly time blocks: 1
Course offered year/period: 2018, First semester
Day/period: Thu.2
Class style: Lecture

Eligible students: For science students
Target year: Mainly 2nd year students

Number of credits: 2

[Outline and Purpose of the Course]
Based upon knowledge of calculus, this is an introductory course to the function theory of one complex variable (i.e. introduction of complex analysis), and its goal is to understand fundamentals about holomorphic functions and meromorphic ones, which are dealt through the Cauchy's integral formula. The purpose of this course is not only to understand rigorous theories but to obtain some skills about the residue calculus. The theory for complex functions are not only beautiful in a mathematical sense but also very useful in applied fields e.g. physics, engineering and medical sciences etc. Almost all the mathematical theories in this course are rigorously dealt with, and some examples related with physics are also explained. An additional goal of this course is to give a chance to the students to present and discuss mathematics in English.

[Course Goals]
The goal is to understand fundamentals about holomorphic functions and meromorphic ones, which are dealt through the Cauchy's integral formula. In addition to learning modern mathematics and proofs, students can also learn how to discuss and present mathematical topics in English through this course.

[Course Schedule and Contents]
The course will cover the following topics, and each of them is read in 2 or 3 weeks:
1. complex numbers, the complex number plane and the Riemann sphere
2. differential of complex functions; holomorphic functions and the Cauchy-Riemann equation etc.
3. power series and analytic functions
4. integral; the Stieltjes integral and Cauchy's integral formula
5. fundamental theories for holomorphic functions
6. singularities and residue; the Laurent expansion and the residue calculus.

[Class requirement]
Eligible students) mainly the sciences of the second grade
Students are required good understanding of both calculus and linear algebra.

[Method, Point of view, and Attainment levels of Evaluation]
The evaluation of the course will take into account the following criteria:
- homework (20%)
- presentation (10%)
- final exam (70%)

[Textbook]
Not Specified

[Reference book, etc.]
Elias Stein, Rami Shakarachi 『Complex Analysis』 (Princeton University Press)
J.B. Conway 『Functions of one complex variable』 (Springer) ISBN:3-540-90328-3

[Regarding studies out of class (preparation and review)]
The students are requested to solve exercises given in class by themselves even though they are not assigned as homework.

[Others (office hour, etc.)]
This class is an English class for the classes of , and their syllabuses are the same to one another.
Office hours are not assigned and it is advisable to make comments willingly during and after the class.

Lecture code: N162001
Course title
<English>
Advanced Calculus I-Vector Calculus

Affiliated department, Job title, Name
Graduate School of Engineering
Associate Professor QURESHI, Ali Gul

Group
Natural Sciences

Field(Classification)
Mathematics(Development)

Language
English

Old group
Group B

Number of weekly time blocks
1

Class style
Lecture

Course offered year/period
2018 • First semester

Day/period
Wed.5

Target year
2nd year students or above

Eligible students
For science students

Number of credits
2

[Outline and Purpose of the Course]
Based on the knowledge of Calculus with Exercises A/B and Linear Algebra with Exercises A/B, or Calculus A/B and Linear Algebra A/B, this course explains calculus of multiple variables and vector calculus.

[Course Goals]
To learn basics of calculus in functions of two or more variables, which are used in many other courses in natural sciences (such as Physics) and engineering.

[Course Schedule and Contents]
1. Riemann integral of multiple variable
   - Iterated integration, change of variables of integration, improper integrals (3 Weeks)
2. Vector fields and potentials at n-dimensional Euclidean spaces
   - Operations over the vector fields (gradient, curl and divergence), scalar potential and vector potential (4 weeks)
3. Line integrals and surface integrals
   - Line integrals at 2-dimensional plain, surface integrals at 3-dimensional space, and integral theorems (Divergence theorem of Gauss, the Green’s formula and the Stokes’s theorem) (7 Weeks)

[Class requirement]
To understand Calculus with Exercises A/B and Linear Algebra with Exercises A/B, or Calculus A/B and Linear Algebra A/B.

[Method, Point of view, and Attainment levels of Evaluation]
Based on Mid-term Examination (40%), and final examination (60%).

[Textbook]
Instructed during class

[Reference book, etc.]
Maurice D Weir and Joel Hass 『Thomas' Calculus』（Pearson）
Erwin Kreyszig 『Advanced Engineering Mathematics』（Wiley）
Frank Ayres and Elliott Mendelson 『Calculus』（McGraw-Hill）
Robert Wrede and Murray Spiegel 『Advanced Calculus』（McGraw-Hill）

[Regarding studies out of class (preparation and review)]
Students are encouraged to do assigned homework related to the classes.

Lecture code: N169001
### [Outline and Purpose of the Course]
This course provides opportunities to learn mathematics in depth for highly motivated students. It supplements Calculus A and Linear Algebra A, and treats more advanced related topics.

### [Course Goals]
In addition to learning modern mathematics and proofs, students can learn how to discuss and present mathematical topics in English through this course.

### [Course Schedule and Contents]
One of the goals of this course is to help students to get used to rigorous proofs of mathematical statements and abstract mathematical notions. These two features are central to and represent the power of modern mathematics, because rigorously proven facts are true forever, and an abstract notion is applicable to various different situations as far as they share one key property.

If the number of students permits, the course will be interactive. In particular, an additional goal of this course is to give a chance to the students to discuss mathematics in English.

Topics will be chosen according to the level of the students. Below is a tentative and non-exhaustive list of themes that could be covered:

1. Rigorous treatment of real numbers.
2. Convergence of sequences and series.
3. Convex functions.
4. Stirling formula.
5. Linear algebra over general fields.
6. Permutations and combinatorics.

The course will be covered within 14 classes.

### [Class requirement]
Calculus A and Linear Algebra A. Students are strongly encouraged to take Calculus B and Linear Algebra B in parallel to this course.

### [Method, Point of view, and Attainment levels of Evaluation]
The evaluation of the course will take into account the following criteria:
- Homework (20%)
- Midterm (20%)
- Final exam (60%)

### [Textbook]
Not used

### [Reference book, etc.]
To be announced.

### [Regarding studies out of class (preparation and review)]
To be announced.

### [Others (office hour, etc.)]
Students are welcome to ask questions during or at the end of the class. The schedule of office hours will be announced later.
Course title: Elementary Probability-E2

Affiliated department: Graduate School of Informatics
Job title: Program-Specific Associate Professor
Name: David Croydon

Group: Natural Sciences
Field: Mathematics
Number of weekly time blocks: 1
Day/period: Thu.2
Class style: Lecture

Number of credits: 2

Eligible students: For science students
Target year: Mainly 2nd year students

Course offered year/period: 2018 · Second semester

[Outline and Purpose of the Course]
Probability theory is indispensable for understanding and describing phenomena influenced by randomness, as arise across the natural and social sciences. Furthermore, it is one of the foundations of mathematical statistics. This lecture course will provide a fundamental introduction to the modern theory of probability.

[Course Goals]
1. To understand fundamental notions in probability theory such as events, random variables, independence, conditional probability, expectation, variance and correlation.
2. To understand when and how typical distributions, such as the normal distribution and Poisson distribution, appear, and mathematical treatments of those distributions.
3. To understand limit theorems, such as law of large numbers and central limit theorem. In particular, to understand when and how those theorems can be applied.

[Course Schedule and Contents]
1. Introduction to the mathematical theory of probability (2 to 3 weeks): probability spaces, events, independence and conditional probability.
2. Introduction to the notion of random variables and related properties (4 weeks): random variable, distribution, expectation, variance, covariance, correlation, independence of random variables and Chebyshev’s inequality
3. Important examples of distributions (3 weeks): Bernoulli distribution, binomial distribution, Poisson distribution, geometric distribution, uniform distribution, normal distribution, exponential distribution.
4. Limit theorems (3 to 4 weeks): law of large numbers, central limit theorem.
5. Random walks and Markov chains (supplementary).

[Class requirement]
Eligible students: mainly the sciences of the second grade. Students are required good understanding of both calculus and linear algebra.

[Method, Point of view, and Attainment levels of Evaluation]
The evaluation of the course will mainly take into account of the result of final examination.

[Textbook]
Instructed during class

[Reference book, etc.]
Richard Bronson and Gabriel Costa 「Differential Equations」 (McGraw-Hill)
Wolfgang Walter 「Ordinary Differential Equations」 (Springer)
Erwin Kreyszig 「Advanced Engineering Mathematics」 (Wiley)
M.D. Weir and J. Hass 「Thomas' Calculus」 (Pearson)

[Regarding studies out of class (preparation and review)]
Strongly recommend to solve exercises given in class to have a deeper understanding of contents of lectures.

Course title: Advanced Calculus II-Differential Equations

Affiliated department: Graduate School of Engineering
Job title: Associate Professor
Name: QURESHI Ali Gul

Group: Natural Sciences
Field: Mathematics
Number of weekly time blocks: 1
Day/period: Wed.5
Class style: Lecture

Number of credits: 2

Eligible students: For science students
Target year: 2nd year students or above

Course offered year/period: 2018 · Second semester

[Outline and Purpose of the Course]
Based on the knowledge of Calculus with Exercises A/B and Linear Algebra with Exercises A/B or Calculus A/B and Linear Algebra A/B, this course explains ordinary differential equations.

[Course Goals]
To learn the different types of differential equations and their solution methods.

[Course Schedule and Contents]
1. Elementary methods of solution- Separation of variables, linear first order differential equations, total differential equations(exact differential equations) and integrating factors (6 weeks)
2. Existence and uniqueness of the solution of initial value problems - Space of continuous functions and it's properties(normed spaces, completeness), iterated approximation, Cauchy-Lipschitz's theorem and the connection of solution (4 weeks)
3. Linear differential equations - Space of solutions of homogeneous equations, variation of parameters, exponential function for matrices and Wronskian determinant. (4 weeks)

[Class requirement]
To understand Calculus with Exercises A/B and Linear Algebra with Exercises A/B or Calculus A/B and Linear Algebra A/B.

[Method, Point of view, and Attainment levels of Evaluation]
Mid-term Examination (40%), final examination(60%).

[Textbook]
Instructed during class

[Reference book, etc.]
Richard Bronson and Gabriel Costa 「Differential Equations」 (McGraw-Hill)
Wolfgang Walter 「Ordinary Differential Equations」 (Springer)
Erwin Kreyszig 「Advanced Engineering Mathematics」 (Wiley)
M.D. Weir and J. Hass 「Thomas' Calculus」 (Pearson)

[Regarding studies out of class (preparation and review)]
Students are encouraged to do assigned homework related to the classes.

[Others (office hour, etc.)]
Content of this course is independent from Advanced Calculus I of 1-st semester.
### Course title
Advanced Course of Electromagnetism-E2

### Affiliated department, Job title, Name
Senior Lecturer, BEAUCLAMP, Anthony Tadeus Herve

### Group
Natural Sciences

### Field(Classification)
Physics(Foundations)

### Language
English

### Old group
Group B

### Number of credits
2

### Number of weekly time blocks
1

### Class style
Lecture

### Course offered year/period
2018 • First semester

### Day/period
Mon.3

### Target year
Mainly 2nd year students

### Eligible students
For science students

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

Based on the knowledge you gained from the Fundamental Physics B course, this course will expand your understanding of electromagnetic theory. After a review of the basics of classical electromagnetism up to Maxwell's equations, we will explore the subjects of electromagnetic wave propagation, interference and diffraction, as well as the derivation of electric and magnetic properties in substances and their boundaries.

#### [Course Goals]
- Follow the historical progression in our understanding of electromagnetic laws.
- Understand the meaning of physical properties in electromagnetism.
- Apply the laws electromagnetism to solve practical problems.

#### [Course Schedule and Contents]

1. Mathematics review: Coordinate systems, fields, gradient, divergence, curl [2 weeks].
2. Electrics review: Coulomb's force, dipoles, electric potential, Gauss's law [2 weeks].
4. AC circuits: Resistive, inductive, and capacitive load [1 week].
5. Maxwell's equations: Electromagnetic radiation, interference, diffraction [4 weeks].
6. Electromagnetic properties in substances and at boundaries [2 weeks].
7. Metamaterials, Cherenkov radiation [1 week].

Final examination [1 week].
Feedback session [1 week].

#### [Class requirement]
Fundamental Physics B course.

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

Evaluation will be based on:
- Class Participation (10%): Student participation will be asked in solving problems and discussing theories and their application.
- Homework (20%): Typical problems will be assigned, which you can solve by applying the laws and methods learnt during lectures (every 2 weeks).
- Quizzes (20%): Mini-exams, to check that you remember important laws and principles from previous lectures and study guides (every 4 weeks).
- Final examination (50%): You will be tested with a series of problems that combine previously studied cases and original cases.

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#### [Textbook]

Study guides will be provided every week (~20 pages per week), to help you expand your knowledge. The study guides closely match the week's topic, providing in-depth explanations, problem solving strategies, and summaries of key points.

#### [Reference book, etc.]

- **Reference book**

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

Study guides will be provided every week (~20 pages per week), to help you expand your knowledge. The study guides closely match the week's topic, providing in-depth explanations, problem solving strategies, and summaries of key points.

#### [Others (office hour, etc.)]

Questions can be sent by email, and will be answered either electronically or by appointment (depending on the case).

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Lecture code: N251001
Introduction to Modern Optics-E2

Outline and Purpose of the Course
Optics is a very practical field of physics that has enabled the fabrication of instruments and devices in almost every other area of science and technology, including chemistry, biology, geology, etc... Students will learn the fundamental properties and behavior of light, and its interaction with matters (refraction, dispersion, diffraction, polarization...). The theory of geometric and wave optics will be taught, and their use in designing high performance optical assemblies from digital cameras to space telescopes.

Course Goals
- Grasp the importance of optics in enabling modern science and technology.
- Understand the various aspects of light propagation in a vacuum and substance.
- Use this knowledge to solve optical design problems using state-of-the-art optical design software.

Course Schedule and Contents
1. A brief history of optics and the nature of light [1 week].
2. Basic of optics: Wavefronts, Fermat's principle, Snell's law [1 week].
4. Imaging systems: Aperture/field stops, pupils, field of view [2 weeks].
5. Optical aberrations: Chromatic and geometric aberrations [2 weeks].
7. Wave optics 2: Fraunhofer diffraction, point spread function [2 weeks].
8. The Optical Software for Layout and Optimization (OSLO):
   - Learn how to layout optical systems [1 week].
   - Learn how to optimize the performance of optical systems [1 week].

Final examination [1 week].
Feedback session [1 week].

Class requirement
None

Method, Point of view, and Attainment levels of Evaluation
Evaluation will be based on:
- Class Participation (10%): Student participation will be asked in solving problems and discussing theories and their application.
- Homework (20%): Typical problems will be assigned, which you can solve by applying the laws and methods learnt during lectures (every 2 weeks).
- Quizzes (20%): Mini-exams, to check that you remember important laws and principles from previous lectures and study guides (every 4 weeks).
- Final examination (50%): You will be tested with a series of problems that combine previously studied cases and original cases.

Textbook

Reference book, etc.
(Reference book)
Introduced during class

Regarding studies out of class (preparation and review)
Personal study using book by Hecht (10–15 pages per week).

Others (office hour, etc.)
Questions can be sent by email, and will be answered either electronically or by appointment (depending on the case).
[Outline and Purpose of the Course]
The objective of the course is to introduce the light control. Starting with explaining the wave equation and basic properties of light, we will expand the lectures up-to cutting-edge technologies of light control by performing some experimental demonstrations.

[Course Goals]
- Understand basic properties of light and light control.
- Follow the cutting-edge technologies.

[Course Schedule and Contents]
1. Introduction to light (1 week)
2. Introduction to vector calculus (1 week)
3. Maxwell’s equations, wave equations (2 weeks)
4. Reflection, transmittance, total internal reflection (2 weeks)
5. Interference theory and its control (2 weeks)
6. Diffraction theory and experiments (2 weeks)
7. Light emission and absorption, and its control (2 weeks)
8. Introduce cutting-edge light control technologies (2 weeks)

[Class requirement]
Fundamental Physics B (recommended)

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on attendance and participation (10%), homework (40%) and final examination (50%).

[Textbook]
Not used

[Reference book, etc.]
Max Born and Emil Wolf Principles of Optics

[Regarding studies out of class (preparation and review)]
Students are required to do their homework. When trouble is encountered during homework, please refer recommended textbook or please ask the instructor.

[Others (office hour, etc.]]
Office hour: Anytime by email and appointments should be made via email.
This course deals with fundamentals of oscillations and waves which commonly relate to various fields in nature such as dynamic motion as well as electromagnetic phenomenon.

**Course Goals**

To understand the basic concepts of wave and oscillation with its mathematical description method.

**Course Schedule and Contents**

The course contents are as follows:

1) Simple harmonic motion
   Equation and solution of simple harmonic motion, energy of harmonic oscillator
2) Damped oscillation and forced vibration
   Resistance and damped vibration, forced vibration and resonance
3) Coupled vibration and normal mode coordinates
   Coupled vibration of spring pendulum, normal mode coordinates of normal vibration, normal vibration of multi degree-of-freedom system
4) Vibration of continuous system
   String vibration, vibration of elastic element, acoustic vibration, Fourier series, natural vibration
5) Waves
   Wave equation and solution, sine wave, plane wave, reflection & transmission
6) Waves superposition and interference
   Wave interference, phase velocity, group velocity

**Class requirement**

Having taken the course “Fundamental Physics A & B” is recommended.

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

Evaluation is based on written test (midterm exam: 40%, final exam: 40%), assignments (10%), and class participation (10%).

**Textbook**

Not used

Some handout materials will be provided during the class.
This lecture will cover all the necessary concepts of physics, in particular classical mechanics, which are deemed necessary for all students of natural science. Although prior knowledge of high school level physics will be presumed, basic concepts of classical mechanics as well as their applications will be revisited and expanded upon systematically. Emphasis will be on enabling students to acquire knowledge of the basic concepts and laws of these classical mechanics consistently and systematically so as to be able to derive and apply them to solving related problems in science and engineering.

**Course Goals**

1) To help students grasp important concepts and laws of physics and how to apply them to common problems in science and engineering.
2) To enable students to develop a deeper problem solving skills in mathematics and physics.

**Course Schedule and Contents**

In dealing with the following topics, particular attention will be given to their application in different fields of science and engineering.

1) Differential equations of motion (2 weeks)
   In this lecture, we will learn how to derive a set of differential equations (kinematic equations) to describe motions of bodies without considering their masses (point masses) or the forces that cause such motions.
2) Motions of system of particles and rigid bodies in planar coordinates (3 weeks)
   In this lecture, we will learn about planar (Cartesian coordinates) and polar coordinate systems and how to use them to analyze motions of systems and rigid bodies.
3) Motions of system of particles and rigid bodies in a polar coordinate systems (3 weeks)
   In this lecture, we will analyze motions of system of particles and rigid bodies using the polar coordinate system.
4) Circular motion; Centripetal forces, motion of solar systems (3 weeks)
   This lecture will explain motions of bodies orchestrated by a central force, and extend the argument to derive equations of circular motion of celestial bodies (such as the revolution of earth around the sun).
5) Conservation of energy (3 weeks)
   This lecture will introduce laws of conservation energy, work, momentum, and angular momentum.
6) Exam and feedback (2 weeks)

**Class requirement**

Knowledge of high school physics will be essential but not a requirement.

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

Short assessment tests 40%, Endterm examination 60%.

**[Textbook]**

Handouts

*Reference book, etc.*


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

Students are strongly encouraged to study introductory mathematical textbooks and other materials to ensure that they are comfortable with the mathematical concepts used to describe equations of motion.

**[Others (office hour, etc.)]**

Office hour will be announced weekly. However, you can always post questions or comments by email anytime.
By using simplified models, we will describe the movement of particles, and learn the physical meaning of force, energy, work, and potential. We will learn how to predict the movement of objects in different situations. With these concepts, we will analyze simple examples such as the linear movement, rotations, the harmonic oscillator, collisions of two bodies and thereby understand theoretical approaches to physical problems.

**[Course Goals]**
- getting a basic understanding of theoretical approaches to physical problems in mechanics
- learning fundamentals of kinematics and dynamics
- being able to use the learned concepts in simple problems.

**[Course Schedule and Contents]**
The course will be adapted to the level of the students! Therefore, the number of weeks may change in order to increase or decrease the speed of the lecture.

- introduction to necessary mathematics used during the course (1-2 weeks)
- Kinematics (speed, acceleration, rotation) (2-3 weeks)
- Dynamics (Newton axioms, examples, rotating systems) (4 - 6 weeks)
- harmonic oscillator (1-2 week)
- energy, work, potential (2-3 weeks)
- collisions of two bodies (1-2 weeks)
- Summary and repetition of the whole course (1 week)

**[Class requirement]**
This course is intended mainly for students who did not select [physics] in the entrance examination.

**[Method, Point of view, and Attainment levels of Evaluation]**
Worksheets/reports (50%) + examination (50%)

**[Textbook]**
Not fixed

**[Reference book, etc.]**
Introduced during class

The worksheets will give students an opportunity to practice their English skills in science.
### Fundamental Physics A

**Course title (in English):** Fundamental Physics A  
**Affiliated department, Job title, Name:** Graduate School of Engineering, Associate Professor, QURESHI, Ali Gul  
**Group:** Natural Sciences  
**Field (Classification):** Physics (Foundations)  
**Language:** English  
**Old group:** Group B  
**Number of weekly time blocks:** 1  
**Number of credits:** 2  
**Number of eligible students:** Mainly 1st year students  
**Course offered year/period:** 2018 • First semester  
**Day/period:** Thu.4  
**Class style:** Lecture  
**Lecture code:** N208001

**Outline and Purpose of the Course:**
Lectures on the topics of physics (classical mechanics) that are common and necessary to all students who study natural sciences.

**Course Goals:**
To acquire knowledge of basic concepts of physics such as motion, energy, gravitation, and the related laws of these topics.

**Course Schedule and Contents:**
1. Kinematics, velocity and acceleration, components of polar coordinates (3 weeks)  
2. Laws of motion, equations of motion and application (3 weeks)  
3. Law of conservation, work and energy, angular momentum, momentum (3 weeks)  
4. Motion due to a central force, planetary motion under the gravitation of the sun (3 weeks)  
5. Motion of a system of particles (2 weeks)

**Class requirement:**
This course is intended mainly for students who studied physics at high school. Those who did not study physics are recommended to take "Elementary Course of Physics A".

**Method, Point of view, and Attainment levels of Evaluation:**
Class performance and quizzes (20%), Midterm examination (30%), and a final examination (50%).

**Textbook:**
Not used

**Regarding studies out of class (preparation and review):**
Students are advised to refer to the class handouts and readings provided in the classes. Homework is assigned to strengthen the learning of the topics covered in class, therefore, it is advised to students to do their homework regularly and carefully.

### A Guide to Modern Physics A-E2

**Course title (in English):** A Guide to Modern Physics A-E2  
**Affiliated department, Job title, Name:** Graduate School of Science, Associate Professor, WENDELL, Roger  
**Group:** Natural Sciences  
**Field (Classification):** Physics (Foundations)  
**Language:** English  
**Old group:** Group B  
**Number of weekly time blocks:** 1  
**Number of credits:** 2  
**Number of eligible students:** For all majors  
**Course offered year/period:** 2018 • First semester  
**Day/period:** Mon.3  
**Class style:** Lecture  
**Lecture code:** N253001

**Outline and Purpose of the Course:**
This course will discuss the fundamentals of classical (Newtonian) mechanics; the first step in understanding many phenomena in the natural world. Lectures will be discussion-oriented and will provide many opportunities for student's to improve their scientific English abilities. In addition, the end of the course will introduce students to topics in modern physics.

**Course Goals:**
To learn and understand basic phenomena from fundamental physical principles and conservation laws.

**Course Schedule and Contents:**
Lectures on the basics of classical Newtonian mechanics will cover the following topics with each covered in two or three weeks:
1) Principles of momentum, velocity, and acceleration  
2) Equations of motion and their applications  
3) Conservation laws, work and energy  
4) Discussing physical phenomena in our daily lives  
5) Introduction to topics in modern physics, such as relativity and quantum mechanics

**Class requirement:**
None

**Method, Point of view, and Attainment levels of Evaluation:**
Student's comprehension of the course material will be evaluated based on participation in in-class discussions (20 points), five homework sets (worth 60 points total), and a final exam or report (20 points).

**Textbook:**
Not used

**Regarding studies out of class (preparation and review):**
Will be presented in class

**Others (office hour, etc.):**
Students interested in improving their scientific English are encouraged to join this course.

Lecture code: N208001  
Lecture code: N253001

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Lecture code: N208001

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Lecture code: N253001
### Course title

**Fundamental Physics B-E2**

**Field(Classification)**

Physics(Foundations)

**Language**

English

**Number of credits**

2

**Day/period**

Thu.3

**Target year**

Mainly 1st year students

**Eligible students**

For science students

### [Outline and Purpose of the Course]

This course will explain students the fundamental concepts of electricity and magnetism. To obtain a better understanding of the concepts, solve the problems during the lectures.

### [Course Goals]

- Understand the basic laws of electricity and magnetism.
- Understand the concepts better by applying the laws and concepts to solve problems.

### [Course Schedule and Contents]

1. Overview of the course, introduction to vector calculus (1 week)
2. Coulomb’s law, electric field, electrostatic potentials (2 weeks)
3. Gauss's law (1 week)
4. Electric field around conductors (1 week)
5. Electrostatic capacitance (2 weeks)
6. Electrostatic energy and force (2 weeks)
7. Boundary-value problems (2 weeks)
8. Electric current (1 week)
9. Magnetic field of moving charges (2 weeks)

### [Class requirement]

None

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

Evaluation will be based on attendance and participation (20%), mid-term examination (30%) and final examination (50%).

### [Textbook]

Not used

### [Reference book, etc.]

- *David J. Griffiths - Introduction to Electrodynamics*

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

Students are required to do their homework. When trouble is encountered during homework, please refer recommended textbook or please ask the instructor.

### [Others (office hour, etc.)]

Office hour: Anytime by email and appointments should be made via email.
### Outline and Purpose of the Course
This course deals with the mechanics of rigid body based on Newton's mechanics. Description of motion of rigid bodies and related applications will be explained in detail.

### Course Goals
To understand various dynamic topics comprehensively based on many practical examples and problems.

### Course Schedule and Contents
The main topics in this lecture are as follows:
(Each item will be covered by 2-3 weeks)

1. Curvilinear motion of a particle
   - Rectangular components, normal and tangential components, cylindrical components
2. Planer motion of a rigid body
   - Translation, rotation about a fixed axis, relative motion analysis using rotating axes
3. General motion of a rigid body
   - Rotation about a fixed point, inertial and non-inertial reference frame
4. Force and energy of a rigid body
   - Mass moment of inertia, equations of motion, principle of work and energy, conservation of energy
5. Impulse and momentum of a rigid body
   - Linear and angular momentum, impact, principle of impulse and momentum, conservation of momentum
6. Three dimensional motion
   - Moments and products of inertia, equations of motion, gyroscopic motion

### Class requirement
Having taken the course "Fundamental Physics A" is recommended.

### Method, Point of view, and Attainment levels of Evaluation
Evaluation is based on written tests (midterm exam: 40%, final exam: 40%), assignment (10%), and class participation (10%).

### Textbook
Not used
Some handout materials will be provided during the class.
Course title: Physics for All-E2

Affiliated department, Job title, Name: Institute for Frontier Life and Medical Sciences, Senior Lecturer, OKEYO, Kennedy Omondi

Field(Classification): Physics(Foundations)

Natural Sciences

Language: English

Old group: Group B

Number of credits: 2

Number of weekly time blocks: 1

Class style: Lecture

Course offered year/period: 2018 • Second semester

Day/period: Tue.3

Target year: Mainly 1st year students

Eligible students: For all majors

[Outline and Purpose of the Course]
The lecture will focus on enabling students of non-physics majors to grasp basic concepts and principles of physics, and to learn how to apply them to understand the physical world around us. Particular focus will be on problem solving in mechanics, which will be presented systematically so that students gain a deeper understanding of mathematical and logical treatment of familiar physical problems. To further cement understanding and nurture students' love for science, theory will be supplemented with experiments as may be necessary.

[Course Goals]
1) To nurture students’ problem solving ability.
2) To impact a deeper understanding of familiar physical phenomena.

[Course Schedule and Contents]
The following topics will be tackled with a presumption that the students have little prior knowledge of physics.
1) Introduction to vectors and motion (2 weeks)

Here we will learn about vectors and how to use them to describe objects in motion.

2) How to understand linear motion of objects and points (3 weeks)

This topic will introduce basics of motion in a straight line such as displacement, velocity, acceleration. Newton's law of motion will also be discussed.

By the end of this topic, you will be able to perform differentiation or integration to find displacement, velocity and acceleration of a body in motion in a straight line.

3) Introduction to simple circular motions and oscillations (3 weeks)

Sometimes motion occurs in a circular path, like when you drive around a curved road. This topic will introduce you to forces involved in circular motion such as centripetal and centrifugal forces. We will make everything pretty simple so that by the end of this topic, you will be able to derive the basic equations of circular motion. We will also look at harmonic oscillation exhibited by a spring attached to a mass and highlight Hooke's law.

4) Introduction to momentum (2 weeks)

We will learn about the relationship between force and velocity, i.e., momentum and how to solve apply the principle of conservation of momentum in solving equations of motion.

5) Introduction to work and energy (2 weeks)

Work and energy are important physical properties. We will learn about how to move from force to obtain work, and also from work to obtain energy (work-energy theorem). Concepts of potential energy and kinetic energy will be introduced and also, the principle of energy conservation will be discussed.

6) Introduction to electricity and magnetism (2 weeks)

A simplifies introduction will be given to highlight the basics of both electricity and magnetism.

7) Exam and feedback (2 weeks)

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Continue to Physics for All-E2(2)
**Course title**
Fundamental Physics B

**Affiliated department, Job title, Name**
Graduate School of Engineering, Associate Professor, QURESHI, Ali Gul

**Group**
Natural Sciences

**Field(Classification)**
Physics(Foundations)

**Language**
English

**Old group**
Group B

**Number of credits**
2

**Number of weekly time blocks**
1

**Class style**
Lecture

**Course offered year/period**
2018 · Second semester

**Day/period**
Thu. 4

**Target year**
Mainly 1st year students

**Eligible students**
For science students

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### [Outline and Purpose of the Course]

The objective of this course is to introduce fundamental concepts of physics relating with electricity and magnetism.

### [Course Goals]

- To understand the basic concepts of electricity and magnetism
- To be able to relate and appreciate the role of these concepts in many natural phenomenon
- To learn about the working of inventions (such as motors, generators, etc.) based on applications of these concepts.

### [Course Schedule and Contents]

1) Introduction to Electric fields, electric charge, Coulomb's law, Electric Flux, Gauss's law, Electric Potential, Equipotential lines and electric fields.(3 weeks)

2) Capacitance and capacitors: Capacitors connected in parallel and series, Equivalent Capacitance (2 weeks)

3) Electric Current, Ohm's Law, Resistors in parallel and series, Equivalent resistance, Kirchhoff’s rules (3 weeks)

4) Introduction to Magnetic Fields, Torque on a Current Loop, charged particle in uniform magnetic field, Magnetic flux (2 weeks)

5) Electromagnetic Induction: Faraday's Law, Lenz's law, generators (2 weeks)

6) Maxwell's Equations and Electromagnetic Waves (2 weeks)

### [Class requirement]

This course is intended mainly for students who studied physics at high school.

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

Class performance and quizzes (20%), Midterm examination (30%), and a final examination (50%).

### [Textbook]

Instructed during class

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**Reference book, etc.**


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

Students are advised to go through the class handouts and the readings suggested in the class for each topic. Homework is assigned to strengthen the learning of the topic covered in the class, therefore, it is advised to the students to do homework regularly and carefully.

### [Others (office hour, etc.)]

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Lecture code: N209001
Course title
<English>
Elementary Experimental Physics-E2

Affiliated department, Job title, Name
Graduate School of Science
Associate Professor, WENDELL, Roger
Graduate School of Engineering
Senior Lecturer, BEAUCAMP, Anthony Tadeus Herve
Graduate School of Science
Senior Lecturer, LEE, Shiu Hang

Group
Natural Sciences
Field(Classification)
Physics(Foundations)

Language
English
Old group
Group B
Number of credits
2

Number of weekly time blocks
2
Class style
Experiment
Course offered year/period
2018 • Second semester

Day/period
Wed.3 4
Target year
Mainly 1st year students
Eligible students
For science students

[Outline and Purpose of the Course]
Natural sciences are the product of experimental investigation and theoretical interpretation. In this course, students will learn to use various measurement instruments to perform experiments. Basic topics in physics will be covered, enabling students to get a deeper understanding of the natural sciences. In addition, techniques for processing and analyzing experimental data will be mastered. Finally, students will learn how to write scientific reports.

[Course Goals]
- Learn physics by carrying out experiments.
- Learn basic skills for processing and analyzing experimental data.
- Learn how to keep a laboratory notebook, and write up experimental reports.
- Learn to give a scientific presentation explaining the results of an experiment.

[Course Schedule and Contents]
1. Foucault's pendulum experiment
2. Coupled oscillations experiment
3. Measurement of electrical resistances
4. Impedance measurements with an oscilloscope
5. Thermal electron emission experiment
6. Temperature measurement with thermocouples
7. Experiments with lasers
8. Measuring the wavelength of light using diffraction gratings
9. Atomic spectroscopy using prisms
10. Franck-Hertz experiment
11. Measurement of Planck's constant

Nine topics will be selected from the list above, each covered in a two or three week.

[Class requirement]
None

Elementary Experimental Physics-E2(2)

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on in-lab experimentation, experimental reports, and one oral presentation. Details will be explained in class.

[Textbook]
Instructed during class
Information about the English language textbook specific to the experiments in the course will be provided during the first lecture.

[Reference book, etc.]
Reference book
Introducted during class
Additional information will be provided during class as necessary.

[Regarding studies out of class (preparation and review)]
Students must read the textbook ahead of each experimental session.

[Others (office hour, etc.)]
Students are encouraged to ask questions during the experimental sessions, and are welcome to contact instructors by email outside of class hours.
Students should make sure to attend the first lecture to receive further information about the course and its textbook.
Introduction to Cosmology-E2

[Outline and Purpose of the Course]
The aim of this lecture is to introduce the basic concepts of modern cosmology. Our current understanding about the history of the universe is explained so that one can capture how observational data are interpreted with the aid of the law of physics in an elementary way. For this purpose, the development of the basic theories of physics necessary to describe modern cosmology will be reviewed in a less rigorous way. The lecture is supposed to be interactive.

[Course Goals]
Students will be able to understand how to approach the study of cosmology in a mathematical and physical way.
They will be introduced to the problems of modern cosmology, and to the methods cosmologist use to try to solve them.
The discussion will tend to link cosmology to other fields in physics, e.g. thermodynamics, (some notions of) particle physics.

[Course Schedule and Contents]
I. Introduction and Historical backgrounds
II. The Role of the Speed of Light in Special Relativity
III. Newtonian Gravity and General Relativity
IV. Homogeneous Universe Model based on General Relativity and Discovery of the Expanding Universe
V. Tips of Thermodynamics
VI. Nucleosynthesis in the Early Universe
VII. Prediction and Discovery of Cosmic Microwave background
VIII. Shortcoming of the Big-Bang Cosmology
IX. Inflationary universe
X. Inevitable Quantum fluctuation
XI. Structure Formation of the Universe
XII. Inflation Again in the Present Universe?

It will be offered to 14 classes for each week of the semester.

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation method: 25%: mid term exam; 75%: final exam.

[Textbook]
M. Rowan-Robinson "Cosmology" (Oxford University Press)

[Reference book, etc.]
A. Liddle "An Introduction to Modern Cosmology" (John Wiley & Sons, Inc.)

[Regarding studies out of class (preparation and review)]
The students will be given the opportunity to have copies of the notes.
They will know a week before the subject to be discussed in the next lecture.

[Others (office hour, etc.)]
Office hours: 2hrs per week to be decided with the students.
### Outline and Purpose of the Course

Starting from Newton mechanics, we will introduce the principle of stationary action, and the Lagrangian formalism for solving problems in theoretical mechanics. Using this formalism, we will analyze different important examples such as oscillations, central forces and the rigid body. Thereafter, we will introduce the Hamiltonian formalism, which is the basis for Quantum mechanics.

### Course Goals
- To understand and be able to use the Lagrangian formalism;
- To understand the basics of the Hamiltonian formulation of classical mechanics

### Course Schedule and Contents

The course can be roughly divided into three parts.

1) theoretical introduction into Lagrangian mechanics with simple examples (4-6 weeks)
   - repetition of Newton mechanics
   - D'Alembert's principle
   - Lagrangian multiplier
   - introduction into variational calculus

2) application of Lagrangian mechanics to more complex situations (6-8 weeks)
   - oscillations
   - central forces
   - rigid body

3) introduction into Hamiltonian formalism (1-2 weeks)

Depending on the progress, a possible extension at the end of the course is an introduction into special relativity.

### Class requirement
Understanding of kinematics and Newton mechanics; basic knowledge of differential equations.

### Method, Point of view, and Attainment levels of Evaluation
Worksheets/reports (50%) + examination (50%)

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Lecture code: N254001
The aim of this lecture is to introduce the basic concepts of Einstein's theory of relativity. First, the theory of special relativity will be explained in detail. After this, the basics of general relativity will be introduced in an elementary way. The lecture is supposed to be interactive.

**Course Goals**
The students will learn the formalism needed to study special/general relativity. They will learn a geometrical intuition in the theory of relativity.

**Course Schedule and Contents**
I. Introduction and Historical Backgrounds
II. Einstein's Principle of Relativity
III. Special Relativity and Lorentz Transformation
IV. Relativistic Mechanics
V. Interesting Examples of Lorentz Transformation
VI. Maxwell Equation and Lorentz Invariance
VII. Relativistic Momentum and Energy II: Four Vectors and Transformation Properties
VIII. General Relativity

It will be offered to 14 classes for each week of the semester.

**Class requirement**
Fundamental Physics A (necessary), Fundamental Physics B (recommended)

**Method, Point of view, and Attainment levels of Evaluation**
Evaluation method: 25%: mid term exam; 75%: final exam.

**Textbook**
Antonio De Felice  Lecture notes given in class.

**Reference book, etc.**
(Hans Stephani  Relativity)
(Wolfgang Pauli  Theory of Relativity)

**Regarding studies out of class (preparation and review)**
The students will know the topic to be discussed in the next lecture, so that they can study on the book and my notes (of which they can have a copy, if needed).

**Others (office hour, etc.)**
2 hours of office hours per week to be decided with students.
### Course title
Introduction to Statistical Physics-E2

### Affiliated department, Job title, Name
Graduate School of Science, Senior Lecturer, PETERS, Robert

### Group
Natural Sciences

### Field(Classification)
Physics (Development)

### Language
English

### Old group
Group B

### Number of credits
2

### Number of weekly time blocks
1

### Course offered year/period
2018 • Second semester

### Day/period
Mon. 2

### Eligible students
For science students

### Target year
Mainly 1st & 2nd year students

### Class style
Lecture

### Lecture code
N257001

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### [Outline and Purpose of the Course]

The first part of the lecture covers basic thermodynamics such as the laws of thermodynamics and thermodynamic potentials. In this part, we will study a variety of examples and applications. The second part of the lecture deals with statistical physics. The goal of the second part is to derive and understand the laws of thermodynamics starting from a microscopic view. Among the subjects covered in this part is the statistical interpretation of temperature and entropy. We will learn the concept of probability and introduce the microcanonical and canonical ensembles and their applications.

### [Course Goals]

- Understanding the laws of thermodynamics and the thermodynamic potentials;
- Understanding the connection between microscopic properties (e.g. velocity-probability) and macroscopic properties (temperature, pressure);
- Understanding the connection between a microscopic Hamiltonian and macroscopic properties.

### [Course Schedule and Contents]

The lecture can be divided into two parts. The first part deals with the laws of thermodynamics and the second part with deriving these laws from microscopic level.

1) Thermodynamics

- Introduction to the laws of thermodynamics (3-5 weeks)
  - equation of state (temperature, pressure, work, heat)
  - energy and entropy
  - applications and examples
- thermodynamic potentials (2-3 weeks)
  - Legendre transformation
  - free energy, enthalpy, ...
- More Applications (2-3 weeks)
  - chemical reactions
  - phase transitions

2) Statistical Physics

- probability (1 week)
- microcanonical ensemble and entropy (2-3 week)
- canonical ensemble, fluctuations (2-3 weeks)

---

### [Class requirement]
None

### [Method, Point of view, and Attainment levels of Evaluation]
Worksheets/reports (50%) + examination (50%)

### [Textbook]
Not fixed

### [Reference book, etc.]
Introduced during class

### [Regarding studies out of class (preparation and review)]
Revision of the course by doing the work sheets

### [Others (office hour, etc.)]
Office hour: After the course

The worksheets will give students an opportunity to practice their English skills in science.
Course title: Basic Organic Chemistry I-E2

Affiliated department, Job title, Name: Institute for Chemical Research, Senior Lecturer, Amelie Perron

Group: Natural Sciences

Field (Classification): Chemistry (Foundations)

Language: English

Old group: Group B

Number of weekly time blocks: 1

Class style: Lecture

Course offered year/period: 2018 • First semester

Day/period: Tue. 5

Target year: Mainly 1st & 2nd year students

Eligible students: For science students

[Outline and Purpose of the Course]

This course is intended for Japanese and international students registered in natural science majors who are interested in learning chemistry in English.

Basic Organic Chemistry I explains the fundamental concepts of organic chemistry, aiming to help students understand the structures and properties of organic compounds. This course can be taken alone or in combination with Basic Organic Chemistry II.

[Course Goals]

Students will be able to analyze the structure of organic compounds and predicting their properties based on their bonding, atomic orbitals, hybridization state, intermolecular forces and resonance structures.

[Course Schedule and Contents]

The following topics will be covered:

1. Introduction to Organic Chemistry
2. Chemical Bonding
3. Atomic Orbitals
4. Hybridization States
5. Molecular Representations
6. Resonance Structures
7. Intermolecular Forces
8. Molecular Polarity
9. Acids and Bases
10. Proton Transfer Reactions
11. IUPAC (International Union of Pure and Applied Chemistry) Nomenclature
12. Alkanes and Cycloalkanes
13. Amino Acids and Proteins
14. Classification and Structures of Carbohydrates

[Class requirement]

None

Basic Organic Chemistry I-E2(2)

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

Evaluation will be based on class attendance and active participation (30%), mid-term exam (30%) and final examination (40%).

[Textbook]


[Reference book, etc.]

Handouts will be provided at the beginning of each lecture.

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

Students should review the course materials after each class.

[Others (office hour, etc.)]

Teaching Approach:

The new concepts are introduced in a skill-building format with practice problems (in class) and exercises (in class) to help students master the course material (no homework).
[Outline and Purpose of the Course]
We learn about the structure, properties and reactions of matters for the base of physical chemistry. Contents are covered by following fields of the structure and properties of the atom and molecules, quantum chemistry, thermodynamics, and chemical reactions. Aim of this course is the understanding of these concepts.

[Course Goals]
The aim of this class is to understand the basic principles of physical chemistry for beginners.

[Course Schedule and Contents]
1. Basics and units of chemistry
2. Structure and property of the atom: Bohr's atomic model
3. Structure and property of the atom: Electronic waviness and orbit function
4. Structure and property of the atom: Electron configuration and periodic table
5. Structure and property of the atom: Ionization energy and electron affinity
6. Molecules: Covalent bonds (s and p-bonds), hybrid orbitals
7. Molecules: Coordinate bond
8. Molecules: Ionic bonds, van der Waals force, and hydrogen bond
9. Thermodynamics: 1st & 2nd law of thermodynamics and phase diagram
10. Chemical equilibrium: Equilibrium constant and Le Chatelier's principle
11. Chemical equilibrium: A rate equation and reaction mechanism
12. Oxidation and reduction: Oxidation state and battery
13. Acid and base: Definition and dissociation equilibrium
14. Acid and base: Neutralization titration, hydrolysis, and buffer solution
15. Term examination

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Results will be evaluated by the submission of homework written in English (30%), attendance and discipline (20%), and assignment (50%).
We learn about the thermodynamics in the state-change of matter, also in the chemical reactions. Contents of the lecture covers the following fields of change of state, thermodynamic laws, definition of the quantities (enthalpy, entropy, free energy, chemical potential), chemical equilibrium, and reaction kinetics. Aim of this course is the understanding of these concepts.

The aim of this class is to understand the basic principles of thermodynamics.

1. Change of the system and quantity of state
2. Thermal energy and work
3. 1st law of thermodynamics: Change of internal energy and enthalpy
4. Chemical reaction and thermal energy
5. Interpretation of internal energy in molecular level
6. Change of state of the ideal gas
7. 2nd law of thermodynamics: Entropy
8. Entropy change in the change of state
9. 3rd law of thermodynamics: Conversion from heat to work
10. Gibbs energy
11. Change of the Gibbs energy when temperature and pressure change
12. Chemical potential
13. Change of state and chemical potential change of matter
14. Chemical equilibrium and rate of chemical reaction
15. Term examination

None

Results will be evaluated by the submission of homework written in English (30%), attendance and discipline (20%), and assignment (50%).

I recommend that the students should review the points to be learned.

Office hours are set at 15:00-17:00 in every Friday.
**Course title**
Fundamental Chemical Experiments-E2

**Affiliated department, Job title, Name**
Graduate School of Engineering
Associate Professor, Cedric Tassel
Graduate School of Engineering
Associate Professor, Juha Lintuluo

**Group**
Natural Sciences

**Field(Classification)**
Chemistry(Foundations)

**Language**
English

**Old group**
Group B

**Number of weekly time blocks**
2

**Class style**
Experiment

**Course offered year/period**
2018 • First semester

**Day/period**
Wed. 3 • 4

**Target year**
Mainly 1st year students

**Eligible students**
For science students

**Number of credits**
2

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### [Outline and Purpose of the Course]

The purpose of this laboratory class is to practice the basic identification techniques and synthesis procedures of chemical compounds as well as to understand the underlying principles involved.

### [Course Goals]

Actual hands-on work performing fundamental analysis and synthesis of chemical compounds will aid you in understanding basic chemical concepts.

### [Course Schedule and Contents]

1. Qualitative Inorganic Analysis Experiments
   - Basic Reactions of Fe³⁺ and Al³⁺ (3rd Analytical Group).
   - Basic Reactions of Ag⁺, Pb⁺, Cu²⁺ and Bi³⁺ (1st and 2nd Analytical Groups).
   - Basic Reactions of Ni²⁺, Co²⁺, Mn²⁺ and Zn²⁺ (4th Analytical Group).
   - Analysis of an unknown sample containing some cations.

2. Volumetric Analysis Experiments
   - Chelatometric Titration: Quantitative Determinations of Ca²⁺ and Mg²⁺ in tap water.
   - Iodometry: Quantitative Determination of NaClO in bleach.
   - Oxidation Reaction Rate: Measurement of pseudo-first-order reaction rate constant.
   - Adsorption of Oxalic acid by Activated Carbon.

### [Experiments in Organic Chemistry]

- Qualitative Analysis of Organic Compounds.
- Organic Synthesis II: Nitration and Hydrolysis.

### [Class requirement]

None

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

Perform totally 12 hands-on chemical experiments, and submit a report for each containing the results of the experiment.

---

**Textbook**

Fundamental Chemistry Experiments ¹

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

Preparation should be done in advance. Understand principles involved, and summarize these beforehand in the experimental note regarding the reagents, equipment, and procedures and methods to be used.

**Others [office hour, etc.]**

- For the registration of the class, please see *1 below.
- Detailed information of the registration will be given at the homepage “KULASIS” in the beginning of April.
- Attend the first class, the course guidance will be given there.
- When you decide to take the class, you must have your own safety glasses as well as obtain the insurance for study and research “学生教育研究災害傷害保険” (Safety glasses can be purchased at the COOP Shop “生協” and the insurance “学生教育研究災害傷害保険” is processed at the Education Promotion and Student Support Department Desk “教育推進・学生支援部”.)

*1 Students must apply for the course before registration if they intend to register for experiment or exercise class of Natural Sciences Group. Please register at the class if you are permitted to participate.

- Application period:
  - 1st semester and 2nd semester / Before the guidance of the first class
  - Posted:
    - 1st semester / Details will be posted on “Notification” (Academic affairs information on liberal arts and sciences) in KULASIS in early April.
    - 2nd semester / Details will be posted on “Notification” (Academic affairs information on liberal arts and sciences) in KULASIS in mid September.
- Application method:
  - 1st semester and 2nd semester / Please bring your student ID card and apply at the venue of the guidance, then attend the subsequent guidance. You cannot correct or cancel the registration on KULASIS. Students not assigned classes are free to choose the day.
  - Selection method:
    - 1st semester and 2nd semester / If the students who wish to take the class are oversubscribed, a lottery will be held. The results will be announced immediately after the guidance.
  - Notice: Unlike the other class designated courses, students can register “Fundamental Chemical Experiments” course even if it is not the day/period of their class designated course. However, this shall not apply in the case if the class is oversubscribed.

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Lecture code: N374001
### Basic Organic Chemistry I-E2

**Course title:** Basic Organic Chemistry I-E2  
**Affiliated department, Job title, Name:** Graduate School of Engineering, Associate Professor, Juha Lintulaito  
**Group:** Natural Sciences  
**Field (Classification):** Chemistry (Foundations)  
**Language:** English  
**Old group:** Group B  
**Number of weekly time blocks:** 1  
**Course offered year/period:** 2018 • First semester  
**Day/period:** Thu.2  
**Class style:** Lecture  
**Outline and Purpose of the Course:**  
The course will provide a complete cover for the first part basics of organic chemistry. This course gives the opportunity to learn English while studying chemistry, an important skill for chemists. This course is suitable for chemistry major students and covers the Basic Organic Chemistry I upos jupos gupos kupos course held for classes T17-22 in Japanese.  
**Course Goals:**  
The students will learn the fundamentals of chemical bonding, stereochemistry and selected organic reactions. Also, the course provides the information for successive attendance in Basic Organic Chemistry II course.  
**Course Schedule and Contents:**  
- Course Introduction (1 Lesson)  
- Structure and Bonding (2 Lessons) Chapter 1  
- Polar Covalent Bonds; Acids and Bases (2 Lessons) Chapter 2  
- Organic Compounds: Alkanes and Their Stereochemistry (2.5 Lessons) Chapter 3  
- Organic Compounds: Cycloalkanes and Their Stereochemistry (2.5 Lessons) Chapter 4  
- An Overview of Organic Reactions (2 Lessons) Chapter 6  
- Alkenes and Alkynes (2 Lessons) Chapter 7  
**Class requirement:**  
This course is suitable for chemistry major students from groups 1T17-1T22.  
**Method, Point of view, and Attainment levels of Evaluation:**  
Class performance, home work, and final test.  
**Textbook:**  
McMurtry 『Organic Chemistry with Biological Applications』 (Cengage Learning) (2nd and 3rd Editions, Chapters 1-4, 6-7)  
Japanese version of McMurtry is also OK.  
**Regarding studies out of class (preparation and review):**  
Home work studies.  
**Others (office hour, etc.):**

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### Revisiting Basic Organic Chemistry II-E2

**Course title:** Revisiting Basic Organic Chemistry II-E2  
**Affiliated department, Job title, Name:** Graduate School of Engineering, Senior Lecturer, LANDENBERGER, Kira Beth  
**Group:** Natural Sciences  
**Field (Classification):** Chemistry (Foundations)  
**Language:** English  
**Old group:** Group B  
**Number of weekly time blocks:** 1  
**Course offered year/period:** 2018 • First semester  
**Day/period:** Thu.4  
**Class style:** Lecture  
**Outline and Purpose of the Course:**  
This course provides an opportunity for students to revisit material covered in the second semester of basic organic chemistry using English. The two purposes of this course are to ensure that students have a firm foundation in basic organic chemistry and to learn to proficiently apply these concepts in English. This course is beneficial for students who have already taken the second semester of basic organic chemistry or who have an interest in learning organic chemistry in English.  
**Course Goals:**  
This course aims to help students have good understanding of basic organic chemistry, particularly in regards to basic organic reactions of alkenes, alkynes, aromatic compounds, alkyl halides, alcohols, phenols and thiols.  
**Course Schedule and Contents:**  
- Introduction  
- Stereochemistry (Chapter 5)  
- Reactions of Alkenes and Alkynes (Chapter 8)  
- Aromatic Compounds (Chapter 9)  
- Alkyl Halides: Nucleophilic Substitutions and Eliminations (Chapter 12)  
- Alcohols, Phenols and Thiols (Chapter 13)  
Each topic will be covered in approximately 1 to 3 weeks based upon the needs of the class.  
**Class requirement:**  
None  
**Method, Point of view, and Attainment levels of Evaluation:**  
Class attendance and participation (20%), homework (10%), quizzes (30%), final exam (40%)  
**Textbook:**  
**Regarding studies out of class (preparation and review):**  
Students should complete assigned homework and turn it in at the beginning of class on the due date.  
**Others (office hour, etc.):**
### Outline and Purpose of the Course

#### Course Overview:
We will discuss basics of quantum chemical theory.

#### Course Goals:
1. Review of physical chemistry II and introduction of quantum chemistry (Schrödinger equation, operators, harmonic oscillator, particle in a box).
2. Angular momentum
3. Theorems of quantum mechanics (Hermitian operators, eigenfunction expansion, commuting operators, parity).
4. Approximation method (Variation method, and perturbation theory).
5. Hydrogen, helium, many-electron atoms (hydrogen and helium, many electron atoms).
6. Electronic structure of molecules

#### Course Schedule and Contents

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<th>Topics week</th>
<th>Note</th>
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<td>Week 1-2</td>
<td>Energy quantization, wave-particle duality, Schrödinger equation, Born interpretation of the wavefunction, operators, the uncertainty principle, the postulates of quantum mechanics.</td>
</tr>
<tr>
<td>Week 3-6</td>
<td>A particle in a box, harmonic oscillator, a particle on a ring, a particle on a sphere.</td>
</tr>
<tr>
<td>Week 7-10</td>
<td>The structure of hydrogenic atoms, atomic orbitals and their energies, spin-orbit coupling, term symbols, selection rules.</td>
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<tr>
<td>Week 11-14</td>
<td>Born-Oppenheimer approximation, valence-bond theory, molecular orbital theory, homonuclear diatomic molecules, heteronuclear diatomic molecules, polyatomic systems.</td>
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<tr>
<td>Final/survey</td>
<td>15 Final exam for Wk 1-14 contents</td>
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**Textbook**


*8th or 10th edition is also OK, but students are responsible to check the differences between editions.*

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**Homework:** During the semester, you will have four homework assignments and the sum of four grades, will count 20% towards the final grade. Problem sets of homework will be assigned from the textbook (see the course textbook). Only legible and intelligible answers will be considered, and otherwise, you will lose some or all credits for the problem. No late homework turn-in will be accepted, unless the late return is excused.

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**Office hour:**

Instructor: Jaehong Park (email: j.park@moleng.kyoto-u.ac.jp)

Course meeting: (Yoshida South campus, XXX, XXX), 1 session/week, 90 mins/session

Office hour: (Location and Time: Katsura campus, A4-205, appointment by email).

Exams: There will be one 90-min final exam. The final exam will be held during the final exam schedule (XX-XX), which will be announced later.

Quizzes: There will be six quizzes. The sum of 6-quiz grade will count 30% towards the final grade.
Equilibrium and Energy-E2: A Macroscopic Perspective of Chemistry

[Outline and Purpose of the Course]
There is a reason why your tea gets cold after a while or water boils at a defined temperature. Energy is the principal driving force of chemical reactions in nature, industrial processes, and of course your daily life. As it turns out, energy comes in many different forms, and follows fundamental laws of exchange and transformation, but never creation. In this course, we will study these laws, learn about the efficiency of energy exchange processes, and understand how energy is used to propel all the important processes in your daily life by considering concrete examples.

[Course Goals]
After this course, students will have good understanding of the most basic thermodynamic laws and will be ready to proceed to more advanced studies on chemical kinetics and statistical mechanics. Students will also be able to understand the English terminologies and scientific expressions.

[Course Schedule and Contents]
The course will cover the following topics, each in a 3 week time span:
1) The big picture: Introduction to thermodynamic systems and their states, and phases.
   We learn how processes in nature are controlled by a few simple properties, like pressure and temperature.
2) It gets hot: Temperature and its scales
   We ask "What is temperature?" and answer this question from various viewpoints.
3) Order and disorder: Phases, the phase diagram, and mixtures
   We discuss the changes substances undergo when varying thermodynamic properties.
4) One-way flow: Forms of energy, energy conservation and transformation
   We learn about different forms of energy, laws for energy flow and their application in daily life.

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Preparing the homework (40%)
Two short test during the lecture (20%)
Final examination (40%)

[Textbook]
Not used
No textbook is used. Lecture notes will be provided during class.

[Reference book, etc.]
Peter Atkins, Julio de Paula 『Physical Chemistry』 (Oxford University Press) ISBN:9780199697403 (Topics from Part 1 - Thermodynamics) Always a good book to have for learning concepts in physical chemistry
Horia Metiu 『Physical Chemistry: Thermodynamics』 (Taylor & Francis) ISBN:9780815340911 (Good book for learning how to apply formulas to real problems and how to calculate properties)
Georg Job, Regina Rueffler 『Physical Chemistry from a Different Angle』 (Springer) ISBN:978-3-319-15666-8 (A good book for getting an intuitive introduction into thermodynamics)

[Regarding studies out of class (preparation and review)]
Students are expected to review the lecture handouts after each class and look up unknown English terms themselves. Homework assignments need to be prepared before the next lecture. It is also encouraged to refer to additional sources of information (books, websites) for the specific topics. If something is unclear or difficult, the instructor can be asked at any time.

[Others (office hour, etc.)]
The lectures will be held in English, but some supporting material and explanations are also given in Japanese. Students are welcome to ask questions in English or Japanese during and after the class. Office hours are flexible. Appointments can be made directly or via email.
Course title: Everyday Life Chemistry-E2

Affiliated department, Job title, Name: Institute for Chemical Research, Senior Lecturer, Amelie Perron

Group: Natural Sciences
Field(Classification): Chemistry(Foundations)

Language: English
Old group: Group B
Number of credits: 2
Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • Second semester

Day/period: Thu. 4
Target year: Mainly 1st & 2nd year students
Eligible students: For all majors

[Outline and Purpose of the Course]
This course is intended for Japanese and international students registered in liberal arts or science. It is designed to provide a basic understanding of the chemistry behind daily life.

[Course Goals]
After this class, you will be able to explain the chemistry behind the aroma of bacon, your morning coffee, why butter is solid, low-calorie foods, trans fats, chocolate crystals, snake venoms, no-tear shampoo and why toothpaste makes your orange juice taste bad.

[Course Schedule and Contents]
The following topics will be covered:

1. A Day without Chemistry
2. Taste Chemistry and Science of Spiciness
3. Sugar and Artificial Sweeteners
4. What is Fat?
5. How do we Smell?
6. Caffeine and Alcohol
7. Chemistry of the Macaroni Salad
8. Forensic Science and Chemistry
9. Chemistry of Love, Phenomones and Chocolate
10. Chemistry of Pain Killers and Poisons
11. Soap and Shampoo Chemistry
12. Chemistry of Colors
13. Group Presentations (Part I and Part II)

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on class attendance and active participation (30%), quizzes during classes (50%) and a 10 min group presentation (20%).

[Textbook]
Not used

Reference book, etc.
Handouts will be provided to the students at the beginning of each class.

Regarding studies out of class [preparation and review]
Students should review the course materials after each class. Students will also be asked to prepare a short group presentation at the end of the semester.

[Others (office hour, etc.)]
Teaching Approach:
Short animation videos followed by throughout explanation of key concepts mixed with open discussions with the students based on quizzes and activities.

Topics (examples):
- Aroma of Bacon
- Chemistry of Love
- Chocolate Tempering
- Chemistry of Coffee
- Shampoo Chemistry
- Wine Chemistry

Lecture code: N362001
Basic Organic Chemistry II-E2

[Outline and Purpose of the Course]
This course is intended for Japanese and international students registered in natural science majors who are interested in learning chemistry in English. Basic Organic Chemistry II explains the fundamental concepts behind the reactivity of organic compounds. This course can be taken alone or in combination with Basic Organic Chemistry I.

[Course Goals]
Students will be able to describe basic organic reaction mechanisms (nucleophilic substitutions, eliminations and electrophilic additions) and apply this knowledge to predict the major product in organic reactions, such as those involving hydrocarbons, alcohols, alkyl halides and alkenes.

[Course Schedule and Contents]
The following topics will be covered:
(1) General Concepts and Stereoisomerism
(2) Enantiomers and Optical Activity
(3) Resonance (Review)
(4) Chemical Reactivity (Nucleophiles and Electrophiles)
(5) Carbocation Rearrangements
(6) Substitution Reactions (Part I and Part II)
(7) Reactivity of Alkenes and Alkynes
(8) Elimination Reactions (Part I and Part II)
(9) Predicting Reaction Mechanisms
(10) Addition Reactions (Part I and Part II)
(11) Organic Synthesis

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on class attendance and active participation (30%), mid-term exam (30%) and final examination (40%).

[Textbook]
**Course title**
Basic Physical Chemistry (quantum theory)-E2

**Affiliated department, Job title, Name**
Institute of Advanced Energy
Senior Lecturer, ARIVAZHAGAN RAJENDRAN

**Group**
Natural Sciences

**Language**
English

**Old group**
Group B

**Number of credits**
2

**Number of weekly time blocks**
1

**Class style**
Lecture

**Course offered year/period**
2018 • Second semester

**Day/period**
Mon. 2

**Target year**
Mainly 1st & 2nd year students

**Eligible students**
For science students

**Outline and Purpose of the Course**
We learn about the basics of quantum chemistry including the duality of the wave and the particle, the quantization of the energy, the wave function and orbitals of atoms, Schroedinger wave equation and spin of electron. Aim of this course is the understanding of these concepts.

**Course Goals**
The aim of this class is to understand the basic principles of quantum chemistry.

**Course Schedule and Contents**
1. Property of the electromagnetic wave
2. Bohr's atomic model
3. De Broglie wave of matter
4. Time independent Schrödinger wave equation
5. Time dependent Schrödinger wave equation
6. One dimensional potential wells
7. One dimensional harmonic oscillation
8. Wave equation of hydrogen atom
9. Wave function and energy eigenvalue of hydrogen atom
10. Angular momentum and Zeeman effect
11. Spin of electron
12. Spin-orbit interaction
13. Wave function of the hydrogen molecular ion and approximation
14. Application of quantum chemistry
15. Term examination

**Class requirement**
None

**Method, Point of view, and Attainment levels of Evaluation**
Results will be evaluated by the submission of homework written in English (30%), attendance and discipline (20%), and assignment (50%).
### Outline and Purpose of the Course

We learn about the basics and application of sustainable energy which can provide inexhaustible energy-supply without releasing the greenhouse gases to the atmosphere, from a chemical point of view. The lecture covers the following contents of solar, wind, geothermal, and biomass energies, photo-catalyst and environmental clean-up, and materials for sustainable energy. The aim of this lecture is to acquire the basic knowledge about materials related to renewable energy and also to understand the mechanism of energy conversion.

### Course Goals

The aim of this class is to understand the basic principles of chemistry of sustainable energy.

### Course Schedule and Contents

1. What is sustainable energy?
2. Solar energy: Inorganic solar cells
3. Solar energy: Organic solar cells
4. Solar energy: Dye-sensitized and quantum dot solar cells
5. Wind energy: Types of wind turbines
6. Wind energy: How wind turbines work?
7. Geothermal energy: Direct use of geothermal energy
8. Geothermal energy: Geothermal power generation
9. Biomass energy: Thermochemical conversion
10. Biomass energy: Biochemical conversion
11. Photo-catalyst: Air purification and sterilization
12. Photo-catalyst: Water purification
13. Materials: Structure and thermal insulation
14. Materials: Polymers and sustainable energy
15. Term examination

### Class requirement

None

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

Results will be evaluated by the submission of homework written in English (30%), attendance and discipline (20%), and assignment (50%).
| **Course title (English)** | Basic Organic Chemistry II-E2  
Basic Organic Chemistry II-E2 |
|----------------------------|----------------------------------|
| **Affiliated department, Job title, Name** | Graduate School of Engineering  
Associate Professor, Juha Lintuluoto |
| **Group** | Natural Sciences  
Field(Classification) |
| **Language** | English |
| **Old group** | Group B  
Number of credits |
| **1** | **2** |
| **Number of weekly time blocks** | 1  
Class style |
| **Course offered year/period** | 2018 ・ Second semester  
Day/period |
| **Thu.2** | **Target year** |
| **Mainly 1st year student** | **Eligible students**  
For science students |

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

The course will provide a complete cover for the second part basics of organic chemistry. This course gives the opportunity to learn English while studying chemistry, an important skill for chemists. This course is suitable for chemistry major students and covers the Basic Organic Chemistry II 「基礎有機化学II」 course held for classes T17-22 in Japanese.

**[Course Goals]**

The students will learn the detailed basics of stereochemistry and selected organic reactions for aliphatic and aromatic compounds. Also, the course provides the information for successive attendance in Organic Chemistry 2nd year courses for chemistry major students.

**[Course Schedule and Contents]**

Reactions of Alkenes and Alkynes (3 Lessons)  Chapter 8  
Aromatic Compounds (3 Lessons)  Chapter 9  
Stereochemistry (2 Lessons)  Chapter 5  
Alkyl halides: Nucleophilic Substitutions and Eliminations (3 Lessons)  Chapter 12  
Alcohols, Phenols, and Thiols (3 Lessons)  Chapter 13  
Feedback (1 Lesson)

**[Class requirement]**

This course is suitable for chemistry major students from groups 1T17-1T22 who passed Basic Organic Chemistry I course.

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

Class performance, home work, and final test.

**[Textbook]**

McMurry  Organic Chemistry with Biological Applications  Cengage Learning  2nd and 3rd Editions, Chapters 5, 8-9, 12-13  
Japanese version of McMurry is also OK.

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

Home work studies.

**[Others (office hour, etc.):]**

Lecture code: N369002
Outline and Purpose of the Course

The purpose of this laboratory class is to practice the basic identification techniques and synthesis procedures of chemical compounds as well as to understand the underlying principles involved.

Course Goals

Actual hands-on work performing fundamental analysis and synthesis of chemical compounds will aid you in understanding basic chemical concepts.

Course Schedule and Contents

[Qualitative Inorganic Analysis Experiments]
1. Basic Reactions of Fe³⁺ and Al³⁺ (3rd Analytical Group).
2. Basic Reactions of Ag⁺, Pb⁺, Cu²⁺ and Bi³⁺ (1st and 2nd Analytical Groups).
3. Basic Reactions of Ni²⁺, Co²⁺, Mn²⁺ and Zn²⁺ (4th Analytical Group).
4. Analysis of an unknown sample containing some cations.
[Volumetric Analysis Experiments]
5. Chelatometric Titration: Quantitative Determination of Ca²⁺ and Mg²⁺ in tap water.
7. Oxidation Reaction Rate: Measurement of pseudo-first-order reaction rate constant.
[Experiments in Organic Chemistry]

Class requirements
None

Method, Point of view, and Attainment levels of Evaluation

Perform totally 12 hands-on chemical experiments, and submit a report for each containing the results of the experiment.

Textbook

Handouts will be distributed by the instructor.
**Outline and Purpose of the Course**

This course provides an opportunity for students to revisit material covered in the first semester of basic organic chemistry using English. The two purposes of this course are to ensure that students have a firm foundation in basic organic chemistry and to learn to proficiently apply these concepts in English. This course is beneficial for students who have already taken the first semester of basic organic chemistry or who have an interest in learning organic chemistry in English.

**Course Goals**

This course aims to help students have good understanding of basic organic chemistry, particularly in regards to the fundamentals of chemical bonding, acid and base chemistry, stereochemistry, alkanes, alkenes, alkynes and select organic reactions.

**Course Schedule and Contents**

The course will cover the following topics:

- Introduction to Organic Chemistry
- Structure and Bonding (Chapter 1)
- Polar Covalent Bonds and Acids and Bases (Chapter 2)
- Alkanes and Functional Groups (Chapter 3)
- Conformation and Stereochemistry of Alkanes (Chapter 4)
- Introduction to Organic Reactions (Chapter 6)
- Alkenes and Alkynes (Chapter 7)

Each topic will be covered in approximately 1 to 3 weeks based upon the needs of the class.

**Class requirement**

None

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

Class participation and attendance (20%), homework (10%), quizzes (30%), final exam (40%)

**Textbook**


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

Students should complete assigned homework and turn it in at the beginning of class on the due date.

**Others (office hour, etc.)**
[Outline and Purpose of the Course]
Course overview: We will discuss basics of thermodynamics

[Course Goals]
1. Physical chemical system
   States of a system, the 0th law of thermodynamics, equation of state, gas laws, real gases, virial equation of state, vapor pressure, critical point, van der Waals equation, reduced variables, principle of corresponding states

2. Energetics
   Basic concepts of thermodynamics (system, surroundings, work, heat, energy), the first law of thermodynamics, enthalpy, state functions, heat capacities, Joule-Thomson effect

3. Entropy and free energy
   The spontaneity of physical and chemical changes, entropy, Clausius inequality, Trouton’s rule, measurement of entropy, Helmholtz energy, Gibbs energy, standard reaction Gibbs energies, Maxwell relations, application of Gibbs energy, the third law of thermodynamics

4. Simple mixtures
   Partial molar quantities, Gibbs-Duhem equation, thermodynamics of mixing, chemical potential, Raoult’s law, Henry’s law, ideal solutions, colligative properties, activities

5. Chemical equilibrium
   Gibbs energy minimum, the description of equilibrium, the response of equilibrium to the conditions, equilibrium electrochemistry

[Course Schedule and Contents]

<table>
<thead>
<tr>
<th>Topics week</th>
<th>Contents</th>
</tr>
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<tbody>
<tr>
<td>1-2</td>
<td>Physical chemical systems 1.2 States of a system, the 0th law of thermodynamics, virial equation of state, vapor pressure, critical point, van der Waals equation, reduced variables, principle of corresponding states</td>
</tr>
<tr>
<td>3-5</td>
<td>Energetics 3-5 Basic concepts of thermodynamics (system, surroundings, work, heat, energy), the first law of thermodynamics, enthalpy, state functions, heat capacities</td>
</tr>
<tr>
<td>6-10</td>
<td>Entropy and free energy 6-10 The spontaneity of physical and chemical changes, entropy, Helmholtz energy, Gibbs energy, the third law of thermodynamics</td>
</tr>
</tbody>
</table>

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Exams: There will be one 80-min final exam. The final exam will be held during the final exam schedule (Jan/24), which will be announced later.

Quizzes: There will be six quizzes. The sum of 6-quiz grade will count 30% towards the final grade.

Grades: One final exam (60%), 6 quizzes (30% = 6×5%), attendance and class participation (10%)
Organic Chemistry of Life-E2

[Outline and Purpose of the Course]
This course is intended for Japanese and international students registered in science majors who are interested in generating their own ideas through creative thinking. It is particularly suited for students interested in pursuing graduate studies in chemistry, life sciences, medicine, pharmaceutical sciences, or agriculture.

Short video lectures are viewed by students at home before the class session, while in-class time is devoted to activities, brainstorming, or projects.

[Course Goals]
This course covers revolutionary ideas from scientists that originated from the integration of chemistry and biology with a main focus on strategies for idea generation.

By the end of this course, you should be able to come up with your own ideas using various creative thinking strategies.

[Course Schedule and Contents]
The following topics will be covered online or in the classroom:

1. What is a Flipped Classroom?
2. Creating Drug Constellations with Chemical Structures
3. Building of a DNA Double Helix Structure
4. Innovative Applications Derived from DNA/RNA
5. Parallel Thinking with the 6 Thinking Hats Technique
6. Creation of a New Product using the Idea Generator Tool
7. Idea Generation based on Amino Acids and Proteins
8. Ideas for Genetically Modified Organisms
9. Fluorescence for Tracking Biology
10. Ideas for Controlling Biology with Light
11. Combinatorial Chemistry and Chemical Genetics
12. SCAMPER Method for Creating Revolutionizing Ideas
13. Ideas for Fooling Sugars and Fats
14. Creative Ways for Fighting Cancer and Viruses

Class requirement
None

Evaluation is based on attendance and active participation (20%), idea generation (50%), and online problems/exercises (30%).

Textbook
Not used

Reference book, etc.
KyotoUx 001x: “The Chemistry of Life” through edX online education platform

Related URL
https://www.edx.org/course/kyotoux/kyotoux-001x-chemistry-life-858#.VEoBHk102xA

[Regarding studies out of class (preparation and review)]
Students have to watch online lectures on the Internet (about 30 minutes per week) before attending the classes. Online lectures can be watched at any time during the week. Classroom activities will be based on the content of the online lectures.

[Others (office hour, etc.)]

Lecture code: N361001
**[Outline and Purpose of the Course]**

These lectures will introduce students to the fundamentals of inorganic chemistry. Atoms, molecules and solids surround us and this lecture will aim at providing students with the tools to better understand their structures, energetics and properties. This course is designed for both Japanese and International students.

**[Course Goals]**

1. To understand the basic structure of atoms as a function of their position in the periodic table.
2. To be able to draw simple molecular structures and orbital diagrams to understand their properties and reactivity.
3. To be able to visualize and comprehend the basic crystal structures of solids and their related stability and properties.

**[Course Schedule and Contents]**

The course will cover the following topics, and each of them is read in 1 or 2 weeks:

1. The structure of hydrogen
2. The structure of many-electron atoms
3. Lewis structures
4. Valence bond theory
5. Molecular orbital theory
6. Bond properties
7. The structure of solids and packing of spheres
8. The structure of metals, alloys and intermetallic compounds
9. Ionic bonding and ionic solids
10. Electronic structures and properties of inorganic solids

**[Class requirement]**

None

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

Evaluation will be based on attendance and participation (10%), homework (40%) and final examination (50%).

**[Textbook]**


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**Introduction to Inorganic Chemistry A-E2(2)**

**[Reference book, etc.]**

- **Reference book**
  
  Introduced during class
  
  Will be announced during the lecture

- **Related URL**
  
  (Will be announced during the lecture)

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

Students are required to do their homeworks and when trouble is encountered during homework, please consult the various recommended textbooks or please ask me.

**[Others (office hour, etc.)]**

Office hour: Anytime by email and appointments should be made via email.
**Course title**: Photo-Energy Conversion-E2
**Affiliated department, Job title, Name**: Graduate School of Engineering, Senior Lecturer, PARK, Jaehong

<table>
<thead>
<tr>
<th>Group</th>
<th>Language</th>
<th>Old group</th>
<th>Number of credits</th>
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<tbody>
<tr>
<td>Natural Sciences</td>
<td>English</td>
<td>Group B</td>
<td>2</td>
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</tbody>
</table>

**Number of weekly time blocks**: 1
**Class style**: Lecture
**Course offered year/period**: 2018 • First semester

**Day/period**: Tue.4
**Target year**: Mainly 1st year students
**Eligible students**: For science students

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

Course overview: We will discuss basic chemical and physical principles as well as various approaches of solar energy conversion.

**[Course Goals]**

1. Course overview
   - global energy problem and overview of photo-energy conversion
2. Semiconductors
   - electrons and holes in semiconductors, Fermi energy, electrochemical potential, work function, charge generation and recombination, radiative and nonradiative recombination
3. Basic structure of solar cells
   - basic mechanisms, pn-junction, heterojunction, Dye solar cell, organic solar cell
4. Alternative Solar Energy Conversion
   - Conversion of thermal radiation into chemical energy, Conversion of chemical energy into electrical energy

**[Course Schedule and Contents]**

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<tr>
<th>Topics</th>
<th>week</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Course overview, Background &amp; Basics 1-2</td>
<td></td>
<td>global energy problem and overview of photo-energy conversion, black-body radiation, photon density, solar spectrum, absorption, solar radiation</td>
</tr>
<tr>
<td>Semiconductors 3-7</td>
<td></td>
<td>electrons and holes in semiconductors, Fermi energy, electrochemical potential, work function, charge generation and recombination, radiative and nonradiative recombination, electron/hole transport and diffusion</td>
</tr>
<tr>
<td>Basic structure of solar cells 8-12</td>
<td></td>
<td>basic mechanisms, pn-junction, heterojunction, maximum efficiency of solar cells, organic solar cells, inorganic solar cells</td>
</tr>
<tr>
<td>Alternative Solar Energy Conversion 13-14</td>
<td></td>
<td>solar fuels, tandem cells, concentrator cells, thermophotovoltaics, up- and down-conversion of photons</td>
</tr>
<tr>
<td>Final Exam week 15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Photo-Energy Conversion-E2(2)**

**[Class requirement]**

None

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

Quizzes: There will be three quizzes. The sum of 3-quiz grade will count 30% towards the final grade.

Grades: One final presentation (40%), 3 quizzes (30% = 3 × 10%), 2 homeworks (20% = 2 × 10%), attendance and class participation (10%)

**[Textbook]**

Not used

**[Reference book, etc.]**


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

Homework: During the semester, you will have two homework assignments and the sum of 2 grades, will count 10% towards the final grade. Only legible and intelligible answers will be considered, and otherwise, you will lose some or all credits for the problem. No late homework turn-in will be accepted, unless the late return is excused.

**[Others (office hour, etc.)]**

Instructor: Jaehong Park (email: j.park@moleng.kyoto-u.ac.jp)

Course meeting: (Yoshida South campus, XXX, XXX), 1 session/week, 90 mins/session

Office hour: (Location and Time: Katsura campus, A4-205, appointment by email).
Introduction to Inorganic Chemistry B-E2

[Outline and Purpose of the Course]
These lectures will introduce students to the fundamentals of inorganic chemistry. This series of lectures will aim at giving students a basic comprehension of chemical reactions (acid-base and redox) as well as the structure of inorganic substances, their properties and their applications in our daily lives. This course is designed for both Japanese and International students.

[Course Goals]
(1) To understand the theories of acid-base and redox reactions. (2) To be able to analyze the symmetry of complex molecules and their related properties. (3) To understand the fundamental theories and their applications.

[Course Schedule and Contents]
The course will cover the following topics, and each of them is read in 1 or 2 weeks

1. Brønsted acids and bases
2. Lewis acids and bases
3. Oxidation and reduction
4. Representation of potentials and applications
5. Molecular symmetry and coordination compounds
6. Electronic structure of d-metal complexes: crystal-field theory and ligand-field theory
7. Properties of d-metal complexes
8. Introduction to the characterization techniques in inorganic chemistry
9. Material chemistry
10. Catalysis

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on attendance and participation (10%), homework (40%) and final examination (50%).

[Textbook]

Introduction to Inorganic Chemistry B-E2(2)

[Reference book, etc.]
Introduce during class
Will be announced during the lecture

[Related URL]
Will be announced during the lecture

[Regarding studies out of class (preparation and review)]
Students are required to do their homeworks and when trouble is encountered during homework, please ask me.

[Others (office hour, etc.)]
Office hour: Anytime by email and appointments should be made via email.

Lecture code: N364001
Chemical Kinetics and Molecular Reaction Dynamics-E2

Course title: Chemical Kinetics and Molecular Reaction Dynamics-E2
Affiliated department, Job title, Name: Graduate School of Engineering, Senior Lecturer, PARK, Jaehong

Group: Natural Sciences
Field(Classification): Chemistry(Development)
Language: English
Old group: Group B
Number of credits: 2
Number of weekly time blocks: 1
Course code: N380001

Eligible students: For science students
Target year: Mainly 1st & 2nd year students
Day/period: Thu.4
Class style: Lecture
Course offered year/period: 2018 • Second semester

[Outline and Purpose of the Course]
Course overview: This course aims to develop both a conceptual and a quantitative understanding of the chemical reaction kinetics. We will explore the quantitative description of reaction rates and mechanisms. We will also cover the features of chemical reactions in a liquid phase.

[Course Goals]
1. Kinetic theory of gases
   ideal gas, distributions, Maxwell distribution of speeds, energy distributions, collisions
2. The rates of chemical reactions
   measurement of reaction rates, reaction rates (differential and integrated rate laws), reaction mechanisms, determining mechanisms from rate laws
3. Theories of chemical reactions
   potential energy surfaces, collision theory, activated complex theory
4. Reactions in liquid solutions
   cage effect, friction, diffusion, electron transfer in solution, Marcus theory, experimental techniques
5. Reactions at solid surfaces
   adsorption, desorption, reactions at surfaces, surface diffusion
6. Photochemistry
   absorption and emission, photophysical processes, photodissociation dynamics

[Course Schedule and Contents]
Topics week Contents
Kinetic theory of gases 1-3 ideal gas law, the kinetic theory of gases, real gases
The rates of chemical reactions 4-6 measurement of reaction rates, reaction rates (differential and integrated rate laws), reaction mechanisms, determining mechanisms from rate laws
The kinetics of complex reactions 7,8 chain reactions, polymerization kinetics, homogeneous catalysis
Molecular reaction dynamics 9-12 collision theory, diffusion-controlled reactions, transition state theory, experimental techniques, electron transfer

[Reference book, etc.]

[Regarding studies out of class (preparation and review)]
Homework: During the semester, you will have five homework assignments and the sum of four grades except the lowest grade that will be dropped, will count 15% towards the final grade. Only legible and intelligible answers will be considered, and otherwise, you will lose some or all credits for the problem. No late homework turn-in will be accepted, unless the late return is excused.

[Others (office hour, etc.)]
Course meeting: (Yoshida South campus, XXX, XXX), 1 session/week, 90 mins/session
Office hour: (Location and Time: Katsura campus, A4-205, appointment by email).
Textbook: no textbook

Photochemistry 13,14 absorption and emission, photophysical processes, photodissociation dynamics
Final/Survey 15 Final exam for Wk 1-14 contents

[Class requirement]
Prerequisites: "Essentials of Basic Physical Chemistry" or "Basic Physical Chemistry"

[Method, Point of view, and Attainment levels of Evaluation]
Exams: There will be one 80-min final exam. The final exam will be held during the final exam schedule (Jan/24), which will be announced later.
Quizzes: There will be six quizzes. The sum of 6-quiz grade will count 30% towards the final grade.
Grades: One final exam (60%), 6 quizzes (30% = 6 × 5%), attendance and class participation (10%)
Introduction to Surface Chemistry-E2

**Course Goals**
Students will learn basic concepts of physical chemistry to understand surface properties and chemical processes at surfaces. Students will also be able to connect surface properties and structure to natural phenomena and industrial applications. Listening to and discussing the subject will help fostering communication skill in English.

**Course Schedule and Contents**
The course will cover the following topics, each in a 2-3 week time span:
1. A cut through everything: We will learn what surfaces and interfaces are, their properties and importance for our daily life.
2. Sticking together: We introduce surface energy and see how this leads to adhesion and water repelling behavior.
3. How not to slip: We learn about surface structure, and get an understanding of how friction between surfaces works.
4. Fogging up of glasses: We learn about adsorption of molecules like water on surfaces.
5. Exhaust transformation: Finally, chemical reactions on surfaces and catalysis will be discussed.

**Class requirement**
None

**Method, Point of view, and Attainment levels of Evaluation**
Preparing the homework (40%)
Two short test during the lecture (20%)
Final examination (40%)

**Textbook**
Not used
No textbook is used. Some handouts will be provided during class.

**Reference book, etc.**
(Reference book)

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Introduction to Surface Chemistry-E2(2)

ISBN:9780471133068 (Covers most topics about surfaces and interfaces, be it solid, liquid or other surfaces)
Elaine M. McCash *Surface Chemistry.* (Oxford University Press) ISBN:9780198503286 (Introductory text about solid surfaces)

**Regarding studies out of class (preparation and review)**
Students are expected to review the lecture handouts after each class and look up unknown English terms themselves. Homework assignments need to be prepared before the next lecture. It is also encouraged to refer to additional sources of information (books, websites) for the specific topics. If something is unclear or difficult, the instructor can be asked at any time.

**Others (office hour, etc.)**
The lectures will be held in English, but some supporting material and explanations are also given in Japanese. Students are welcome to ask questions in English or Japanese during and after the class. Office hours are flexible. Appointments can be made directly or via email.
With the onrushing of human development at the expense of the Earth’s natural resources, we have now entered a new geological epoch: the Anthropocene. The human footprint on the Earth has never been greater and it is said that the world’s biodiversity is now in the midst of the sixth extinction. This is where the relatively new science of conservation biology comes in. In this course, students learn about threats to biodiversity, loss of ecosystem services, extinction, and the importance of conserving nature, from individual species to entire ecosystems.

[Course Goals]
In this course, students will learn to:
- assess how human activities contribute to biodiversity loss and what can be done to prevent it
- weigh the costs and benefits of exploiting natural resources while considering social, economic, political and ecological factors simultaneously
- appreciate the importance of nature and natural reserves to human health and well-being
- engage in conservation activities and design conservation strategies to reduce their own footprints on planet Earth

[Course Schedule and Contents]
- Week 1 - the rise of conservation biology
- Week 2 - what is biodiversity and why should we conserve it?
- Week 3 - threats to biodiversity I: habitat destruction and fragmentation
- Week 4 - threats to biodiversity II: over-harvesting
- Week 5 - threats to biodiversity III: invasive species
- Week 6 - threats to biodiversity IV: climate change
- Week 7 - mid-term exam
- Week 8 - extinction is forever
- Week 9 - conservation strategies I: a focus on endangered species
- Week 10 - conservation strategies II: protected areas
- Week 11 - conservation strategies III: sustainable development
- Week 12 - conservation strategies IV: public outreach and education
- Week 13 - the rise of the conservation biologist
- Week 14 - the conservation biologist in you: student project summaries
- Week 15 - final exam
- Week 16 - student feedback

Conservation Biology-E2(2)

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
attendance and class participation - 10%
student projects - 30%
mid-term - 30%
final exam - 30%

[Textbook]
This book is freely available online at: https://conbio.org/images/content_publications/ConservationBiologyforAll_reducedsize.pdf

[Regarding studies out of class (preparation and review)]
Students should read the relevant sections of the textbook before classes to enhance participation and understanding. The instructor will inform students which sections of the book to read for the following week. Also, students must also find at least one conservation-related news item each week during the course to stay up-to-date with current events. Each lecture will include time for student discussion related to these news items. The mid-term and final examinations will be based upon both lecture material and items covered in the textbook.

[Others (office hour, etc.)]
Students are strongly encouraged to participate in class discussion and ask a lot of questions!
### Course title
Animal Behavior-E2

### Affiliated department, Job title, Name
Primate Research Institute
Associate Professor, Andrew MacIntosh

### Group
Natural Sciences

### Field (Classification)
Biology (Issues)

### Language
English

### Number of weekly time blocks
1

### Class style
Lecture

### Course offered year/period
2018 • First semester

### Day/period
Fri. 3

### Target year
All students

### Eligible students
For science students

### Number of credits
2

### Course offered  year/period
2018 • First semester

### Final Exam - 40%

### Textbook

### Reference book, etc.

### Regarding studies out of class (preparation and review)

### Others (office hour, etc.)
This course has no scheduled office hours, but the instructor is happy to receive emails and meet either before or after class by appointment.

In addition to the weekly lectures, this course includes a field practicum at Arashiyama (Iwatayama) Monkey Park where students will learn to study and identify animal behavior. Details, including dates and content, will be discussed with students in class. Students should ensure they have the necessary insurance.

Students are strongly encouraged to participate in class discussion and ask a lot of questions!
**[Course Goals]**

1. To understand the principles of how organisms respond to their environments, populations grow and go extinct, species interact through food webs and mutualisms, communities are structured, and ecosystems work as systems, cycling nutrients and energy.
2. To learn about the environmental challenges that we will encounter in the coming century, and how ecological principles inform our solutions to mitigate and adapt to them.
3. To be able to describe the ideas behind mathematical ecological theories using graphs, and to appreciate their predictions and assumptions.
4. To sharpen listening skills, and interact in a classroom setting in English.

**[Course Schedule and Contents]**

1. Introduction: The Science of Ecology
2. Evolution and Ecology
3. Behavioural Ecology
4. Population Distribution, Abundance, Growth, and Regulation
5. Population Dynamics
6. Competition
7. Assignment: Analysis of Ecological Data
8. Predators and Herbivores
9. Other Species Interactions
10. Species Diversity
11. Applied Problem: Harvesting Populations
12. Applied Problem: Conservation
13. Energy and Nutrient Cycles
14. Landscape and Global Ecology
15. Final Exam
16. Feedback

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**Introduction to Ecology-E2(2)**

Understanding of high school biology is recommended.

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

Assessment will comprise of class attendance and completion of quizzes (10%), assignments (40%), and a final examination (50%). The final examination will test whether students have achieved the course goals. Students who are absent more than five times will not be credited.

**[Textbook]**

Not fixed

**[Reference book, etc.]**


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

To achieve the course goals students should review the course materials plus optionally the according chapters in the recommended text books after each class. The time necessary for review should be in the range of 2-3 hours per class.

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Lecture code: N905001
[Outline and Purpose of the Course]
DNA contains all the information needed to build complex organisms from a single cell. Inside cells, DNA is packaged into discrete bodies called chromosomes. This class will give students a very basic introduction to the fascinating world of chromosomes. Students will learn what chromosomes are, how DNA is packaged inside them, how they replicate and divide, and how problems with chromosomes can lead to disease. This introductory class is also intended to give students a foundation for further studies of genetics and genomics.

[Course Goals]
- To understand the central importance of chromosomes in biology
- To understand how chromosomes are transmitted from one generation to the next, i.e., the fundamentals of genetics and heredity
- To understand how problems with chromosome maintenance can lead to disease
- To understand how researchers can visualize, isolate, and study chromosomes

[Course Schedule and Contents]
1. Overview of the course; human chromosomes and chromosome disorders
2. Small-scale structure of chromosomes: DNA and nucleosomes
3. Large-scale structure of chromosomes, chromosome condensation and cohesion
4. How chromosomes behave during cell division
5. Chromosomes and the cell nucleus
6. Sex chromosomes
7. Meiosis introduction: how sex creates diversity
8. Meiotic chromosome pairing
9. Meiotic recombination
10. Chromosome evolution
11. Chromosomes and genome sequence
12. Chromosome structure from sequence data
13. Chromosome diversity: a survey of unusual and fascinating chromosome variations
14. The current frontier of chromosome biology

[Class requirement]
The course is open to all students, but a background in biology is recommended highly.

[Method, Point of view, and Attainment levels of Evaluation]
Grading will be based on three areas: active participation, quizzes, and a final exam. Each area will contribute 1/3rd of the total grade.

[Textbook]
Not used

[Regarding studies out of class (preparation and review)]
For some students, the material will be familiar, but the English vocabulary will be new. For other students, both the content and the vocabulary will be new; for these students, this class may require extensive out-of-class study.

[Others (office hour, etc.)]
Office hours will be 1 hour once per week; schedule to be announced on the first day of class.

Lecture code: N904001
<table>
<thead>
<tr>
<th>Course title</th>
<th>English</th>
<th>Field(Classification)</th>
<th>Biology(Issues)</th>
</tr>
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<tbody>
<tr>
<td>Basic Plant Science-E2</td>
<td>Natural Sciences</td>
<td>Biology(Issues)</td>
<td></td>
</tr>
<tr>
<td>Graduate School of Agriculture</td>
<td>Associate Professor, Garry John PILLER</td>
<td></td>
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<table>
<thead>
<tr>
<th>Group</th>
<th>Language</th>
<th>Old group</th>
<th>Number of credits</th>
<th>Number of weekly time blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Sciences</td>
<td>English</td>
<td>Group B</td>
<td>2</td>
<td>1</td>
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<tr>
<th>Day/period</th>
<th>Course style</th>
<th>Course offered year/period</th>
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</thead>
<tbody>
<tr>
<td>Mon. 2</td>
<td>Lecture</td>
<td>2018 • First semester</td>
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<tr>
<th>Eligible students</th>
<th>Target year</th>
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<tbody>
<tr>
<td>For science students</td>
<td>Mainly 1st &amp; 2nd year students</td>
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**[Outline and Purpose of the Course]**

The purpose of this course is to provide a fundamental understanding of plant biology with potential applications to the fields of agriculture, horticulture, botany, food, ecology, and conservation. In this course, basic knowledge of flowering plant structure, function, reproduction, physiology, and genetics will be covered.

**[Course Goals]**

Upon successful completion of this course, students will be able to:
* Identify major plant parts and function
* Explain the fundamentals of plant physiology and reproduction
* Collect, analyze, and interpret data related to plant growth and development
* Think critically about plant science and research

**[Course Schedule and Contents]**

Course Schedule
1. Plants & People
2. Cells, Tissues, & Meristems
3. Stems
4. Leaves & Roots
5. Cell Function
6. Resource Acquisition & Transport Systems
7. Respiration
8. Photosynthesis/ Mid Term exam
9. Life Cycles
10. Flowers & Sexual Reproduction
11. Seeds & Fruits
12. Control of Growth & Development
13. Genetics & Evolution
14. Biotechnology
15. End of Term Exam
16. Feedback

**[Class requirement]**

None

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

Grading: Class attendance, active participation & listening quizzes (20%), presentation (20%), weekly quizzes based on assigned pre-class reading materials (30%), and an end of term exam (30%)

**[Textbook]**

Not used

**[Reference book, etc.]**

(Reference book)

Handouts and supplemental readings will be distributed electronically and/or as a hard copy in class.

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

Students should read or listen to the required pre-class materials and submit any required assignment before the class, and come to class ready to participate in class activities. Typically, this will entail listening to a short video or podcast (10 min. or less), as well as reading a 2 or 3 page handout and be prepared to write answers to 1 or 2 questions about the reading material in the following class (15 to 20 minutes provided in class).

**[Others (office hour, etc.)]**

Open door policy during office hours, and anytime by email.
Course title: Introductory Plant Ecology-E2

Affiliated department, Job title, Name: Graduate School of Agriculture, Associate Professor, Garry John PILLER

Group: Natural Sciences

Field(Classification): Biology(Issues)

Language: English

Old group: Group B

Number of credits: 2

Number of weekly time blocks: 1

Eligible students: For science students

Day/period: Wed.3

Target year: Mainly 1st & 2nd year students

Course offered year/period: 2018 • First semester

[Outline and Purpose of the Course]

Plant ecology underpins many scientific disciplines, including ecosystem rehabilitation, conservation and management biology, and research on climate change impacts. This course will introduce students to the principles of plant ecology. The focus will be on the factors that influence plant distribution and abundance: light, water, nutrients, growth patterns, plant and animal interactions, and disturbances. In addition, current ecological issues such as climate change and exotic species invasions will be examined.

[Course Goals]

Upon successful completion of this course students will be able to:

* Explain the fundamental processes that influence species’ distribution and abundance
* Discuss interactions between plants and the environment, as well as with other organisms
* Apply ecological principles to environmental issues
* Access and critically analyze basic research pertaining to plant ecology

[Course Schedule and Contents]

Course Schedule
1. Introduction to Plant Ecology
2. Light
3. Water Relations
4. Soils & Nutrition
5. Evolutionary Processes
6. Population Structure
7. Growth & Reproduction
8. Community Patterns
9. Competition
10. Herbivory & Plant-Pathogen Interactions
11. Disturbance & Fire
12. Succession
13. Communities in Landscapes
14. Global Change: Humans & Plants
15. End of Term Exam
16. Feedback

[Class requirement]

None

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

Grading: Class attendance and submission of questions related to listening exercise (20%), weekly quizzes based on assigned pre-class reading materials (30%), in-class group presentation (20%) on a topic in the field of plant ecology, and an end of term exam (30%).

[Textbook]

Not used

[Reference book, etc.]

(Reference book)

Handouts will be given out in class, as well as emailed to the students.

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

Students should read or listen to the required pre-class materials and submit any required assignment before the class, and come to class ready to participate in class activities. Typically, this will entail listening to a short video or podcast (10 min. or less), as well as reading a 2 or 3 page handout and be prepared to write answers to 1 or 2 questions about the reading material in the following class (15 to 20 minutes provided in class).

[Others (office hour, etc.)]

Open door policy during office hours, and anytime by email.

Lecture code: N494001
[Outline and Purpose of the Course]
Reproductive biology has always been an exciting and a fascinating field of study. Among the many scientific subjects in the natural sciences, knowledge about reproduction commands interest even among those who have no scientific inclination at all. Reproduction is a sequence of events beginning with the development of the reproductive system in the embryos followed by production of fertile gametes, attainment of reproductive behavior, copulation, fertilization of gametes, implantation of the embryo, development of conceptus and parturition. It is a fundamental feature and each individual animal exists as a result of reproduction. Under the Animal Reproduction lecture series, we will cover some of the fundamental aspects of reproductive biology.

[Course Goals]
The course intends to educate the students on basic and applied reproductive biology of animals including humans.

[Course Schedule and Contents]]
1. Introduction
2. Male reproductive system
3. Female reproductive system
4. Reproductive endocrinology
5. Reproductive cyclicity
6. Embryogenesis of reproductive system
7. Gametogenesis
8. Puberty
9. Reproductive behaviour
10. Sperm in the female reproductive tract
11. Early embryogenesis and maternal recognition of pregnancy
12. Placentaion and the endocrinology of gestation and parturition
13. Puerperium, mammary gland development and lactation
14. Artificial insemination and embryo transfer technology
15. Feedback (To be announced in the class)

[Class requirement]
Students with a basic understanding of biology are preferred.

Animal Reproduction-E2(2)

[Method, Point of view, and Attainment levels of Evaluation]
The students will be assessed based on assignments (2, 10 points each), quizzes (5, 10 points each), and discussions (30 points) in the class.

[Textbook]
The students will be provided soft copy of the presentation via KULASIS or email. Other reading material will also be provided, if necessary.

[Reference book, etc.]

[Related URL]
http://www.reprod.kais.kyoto-u.ac.jp/(Laboratory Home Page)

[Regarding studies out of class (preparation and review)]
Students will be provided with presentation after the class and are expected to read it. The salient learnings of the previous class will be discussed before starting the next class.

[Others (office hour, etc.)]
By appointment (To be announced in the class).
Basic Biology-E2(2)

[Outline and Purpose of the Course]
This class will provide a basic introduction to molecular and cell biology, in English. The class is open to 1st and 2nd year students, and will assume some prior familiarity with elementary chemistry and biology, although students from other majors are welcome to attend. The objective for the class is to nurture an intellectual curiosity about molecular and cell biology, which will lead to more in-depth study later on. We will pay attention to some of the similarities in different organisms, as well as some of the obvious differences, not only between organisms but between cell types, and at the molecular level of protein functions.

[Course Goals]
Students will gain familiarity with the fundamental components of cells, and begin to learn how cellular function depends on complex interactions between proteins, nucleic acids, lipids, and carbohydrates, acting alone, in complexes, or in larger structures, such as organelles. Students should begin to appreciate how fundamental processes are conserved over evolutionary time, and also how they vary in different species.

[Course Schedule and Contents]
First Semester, Mondays, 13:00-14:30
1. Big and Small: organisms and molecules
   - Weeks 2-9 will introduce the basic parts that build living cells.
2. Carbohydrates
3. Nucleic Acids-DNA, nucleotides, genes, etc.
4. Nucleic Acids-RNA, ribonucleotides, coding RNAs, non-coding RNAs, etc.
5. Proteins: structural proteins, enzymes, machines
6. Information Flow, the central dogma and beyond.
7. Ribonucleoproteins, including ribosomes and protein translation
8. Lipids and membranes: what makes a cell a cell?
9. Membranes: inside, outside, and channels
10. Energy and Metabolism: what is the power source of the cell?
11. Gene Regulation: how are genes turned on and off?
12. Prokaryotic Cells: basic biology and social interactions
13. Eukaryotic Cells: types of cells; cell differentiation; and more
14. Regulation-homeostasis, communication, and signaling
15. Final Exam
16. Feedback class

[Class requirement]
The class is open to all 1st and 2nd year students, but it assumes some basic (high school) knowledge of chemistry and biology.

Lecture code: N911001
### Outline and Purpose of the Course

This course provides an introduction to computational biology and applied statistics with the intention to equip students with the tools to analyze and extract information from (large-scale) biological data and to improve their understanding for basic statistical concepts and study design. Although topics will be introduced at a beginner’s level, prior knowledge about basic molecular biology is advantageous. The lectures cover major bioinformatic and biostatistical topics, software tools, and databases and are augmented by application examples to foster proficiency in computational analysis and statistical thinking.

### Course Goals

The goal of this course is to equip students with:
- computational proficiency for scientific data analysis
- skills for data retrieval, processing, visualization, and interpretation depending on biological contexts
- knowledge about the theoretical basis of computational biology and applied statistics
- statistical thinking for study design and evaluation

### Course Schedule and Contents

The following topics will be covered over the course of 14 lectures:

- Molecular biology basics (DNA, RNA, proteins, and cellular processes)
- Overview on bioinformatics research areas and methods
- Biological databases, data retrieval, and processing
- Computational tools and workflows for biological data analysis and visualization
- Sequence alignment and phylogenetics
- Genomics and proteomics
- Biostatistical techniques for data exploration
- Sampling and experimental design
- Probability and distributions
- Statistical inference and hypothesis testing
- Networks and clustering

### Class requirement

Access to a personal computer is required in order to complete homework assignments.

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

- 20 % Class attendance/ participation
- 50 % Homework assignments
- 30 % Final written examination

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# Introduction to Biological Data Analysis-E2(2)

The following books give deeper insights into presented topics, but are no mandatory prerequisites to successfully complete the course.


### [Reference book, etc.]

- (Reference book)
  - Introduced during class
- (Related URL)
  - (Announced during class.)

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

Weekly review of course content is advised. Handouts will be provided by the instructor. The completion of homework assignments in groups of 1 to 3 students and the preparation for the final written exam require additional time investment outside of class.

### [Others (office hour, etc.)]

- Announced during class.

Lecture code: N928001
Introduction to Molecular Biotechnology-E2(2)

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on class attendance and active participation (~20 %), mid-course tests (~30 %) and a final examination (~50 %)

[Textbook]

[Reference book, etc.]
Introduced during class

[Regarding studies out of class (preparation and review)]
*Full lecture handouts will be provided one week before each lecture, and will also be uploaded on KULASIS. It is expected that students will have read through the handouts at least once before each lecture to familiarize themselves with the contents. During the lecture, active listening and participation (e.g. by asking questions) will ensure a greater understanding of the basic concepts. Finally, and most importantly, a private review of the handout immediately after the lecture will ensure a full and solid understanding of the lecture concepts

[Others (office hour, etc.)]
The course is presented as a series of engaging and active lectures with demonstrations and video presentations.
Questions and discussions during class are highly encouraged.
I run an open door policy; questions and discussions will be happily addressed anytime, even outside the official office hour.
Principles of Genetics-E2

**Course Goals**

To acquire a basic understanding of the principles of classical and molecular genetics and their relevance and application to modern biological sciences.

**Course Schedule and Contents**

Main Topics:
1. Development of modern genetics
2. Cells and cell division
3. Mendelian inheritance
4. Extensions of Mendelian genetics
5. Chromosomes and chromosome aberrations
6. Genomes, DNA structure and replication
7. Gene expression and regulation
8. DNA mutations and repair
9. Techniques in molecular genetics and genomics
10. Cancer genetics
11. Developmental genetics
12. Behavioral, population and evolutionary genetics
13. Special topics in modern genetics
14. Applications of molecular genetics in microbiology, agriculture and medicine
15. Final Exam
16. Feedback

**Class requirement**

None

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**Outline and Purpose of the Course**

Genetics is the science of heredity that seeks to explain variation between related organisms. All aspects of life are affected by the expression of genes. As our understanding of the genome increases, it is expected that the application of classical and molecular genetic information will become an indispensable tool in the development of microbial, plant, animal and medical studies.

The course will begin by considering the basic concepts of inheritance, i.e. how Mendelian traits are passed to the next generation, will then outline our current understanding of chromosomes, DNA and genes and their regulation, and will finally examine how such genes can affect developmental programmes, cancer and behavior of organisms.

**Course Offered Year/Period**

2018 • First semester

**Number of Weekly Time Blocks**

1

**Class Style**

Lecture

**Number of Credits**

2

**Target Year**

Mainly 1st & 2nd year students

**Eligible Students**

For science students

**Language**

English

**Old Group**

Group B

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**Principles of Genetics-E2(2)**

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

Evaluation will be based on class attendance and active participation (~20%), mid-course tests (~30%) and a final examination (~50%)

**Textbook**


**Reference book, etc.**

Introduced during class

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

*Full lecture handouts will be provided one week before each lecture, and will also be uploaded on KULASIS. It is expected that students will have read through the handouts at least once before each lecture to familiarize themselves with the contents. During the lecture, active listening and participation (e.g. by asking questions) will ensure a greater understanding of the basic concepts. Finally, and most importantly, a private review of the handout immediately after the lecture will ensure a full and solid understanding of the lecture concepts*

**Others (office hour, etc.)**

*The course is presented as a series of engaging and active lectures with demonstrations and video presentations. Questions and discussions during class are highly encouraged. I run an open door policy; questions and discussions will be happily addressed anytime, even outside the official office hour.*
[Outline and Purpose of the Course]
In this seminar course, we will read various biological reviews, articles, and essays in turn in English. Students will be expected to deeply understand their contents. Supporting information like a scientific background, histories or experimental methods will be provided as needed. If necessary, short complementary comments in Japanese will be also available. Lesson materials used for the seminar course will be different from the second term.

[Course Goals]
Students will learn how to read scientific reviews, essays, and articles.
- To grasp the essence of the article and summarize it efficiently.
- To find interesting points in scientific articles.
- To find complementary articles if necessary.
- To read articles critically and purposefully.

[Course Schedule and Contents]
1) In the first week, I will give an instruction of the seminar course. I will discuss an article to show the style of presentation. Then each week, several biological articles (especially from plant science) to be prepared for a later week will be presented to one of the students, who can make the choice based on his or her preference.

2) 14) Each student prepares a presentation about the article with support of me if necessary and presents it at the seminar in turn. Other students are expected actively to join the discussion. Complementary information for the article will be provided as needed.

15) I will provide a course summary for the feedback session.

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Class attendance and active participation (70%)
Presentation following questions and answer session (30%)

[Textbook]
Instructed during class
Several candidate articles will be provided at the first lesson. Students will choose one of them and give a presentation about it at the class.

[Regarding studies out of class (preparation and review)]
Students should read the provided article in advance.

[Others (office hour, etc.)]
Contact: mizuki.takenaka@pmg.bot.kyoto-u.ac.jp
Any questions and requests are welcome by prior arrangements via E-mail.

Lecture code: N925001
### Course title
Fundamentals of Neuroscience-E2

### Affiliated department, Job title, Name
Graduate School of Medicine, Senior Lecturer, ZENAS C. CHAO

### Group
Natural Sciences

### Field (Classification)
Biology (Issues)

### Language
English

### Old group
Group B

### Number of credits
2

### Number of weekly time blocks
1

### Class style
Lecture

### Course offered year/period
2018 • First semester

### Day/period
Mon. 5

### Target year
All students

### Eligible students
For all majors

### Course Schedule and Contents

1. **Introduction**
2. **PART I. Neurons & Neural Networks**
3. **Neurons & Glia**
4. **The Resting Potential**
5. **The Action Potential & Its Propagation**
6. **Synaptic Transmission**
7. **Computation in Small Circuits**
8. **Synaptic Plasticity**

**PART II. Functions of the Brain**
9. **Brain Anatomy**
10. **Sensory System - Vision**
11. **Sensory System - Audition**
12. **Motor System**
13. **Learning & Memory**
14. **Attention & Consciousness**
15. **Self & Society**
16. **Final Exam**
17. **Feedback**

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### [Outline and Purpose of the Course]
This course covers the basic background required to understand how networks of neurons could mediate complex functions of the brain. Students will learn topics ranging from the electrical properties of an individual neuron to higher brain functions, such as memory and consciousness. In this class, more emphasis is put on real-world assignments. For example, students may interview a neuroscientist or review a neuroscience topic of their choice with a written report or YouTube video.

### [Course Goals]
1. To understand the basic components of the nervous system.
2. To appreciate the complexity of brain functions and to understand their biological basis.
3. To independently obtain, review, and share exciting topics in neuroscience research.

### [Class requirement]
None

### [Method, Point of view, and Attainment levels of Evaluation]
Participation (~20%), quizzes (~25%), final exam (~25%), homework assignments (~30%).

### [Textbook]
Instructed during class
Lecture notes will be provided.

### [Reference book, etc.]
Mark Bear, Barry Connors, Mike Paradiso 『Neuroscience: Exploring the Brain.』 (Wolters Kluwer) ISBN: 1451109547 〈Not mandatory〉
UTHealth Neuroscience Online Textbook: http://neuroscience.uth.tmc.edu/

### [Regarding studies out of class (preparation and review)]
Students are expected to be active participants in class discussions, and to spend 1–2 hours per week to review the course materials.

### [Others (office hour, etc.)]

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Lecture code: N917001
Introduction to Behavioral Neuroscience A-E2

[Outline and Purpose of the Course]
Behavioral Neuroscience investigates the neural basis of behavior. Part A of this course will provide an introduction to basic neuroanatomy, neural functioning, neuroscience methods, perception, attention, and movement. The course will employ an integrative approach by discussing both research results obtained with brain imaging in humans and experiments in animal models.

[Course Goals]
- To understand how our brain processes information.
- To understand the methods used to investigate the brain and behavior.
- To be able to critically evaluate research findings in behavioral neuroscience reported in the public and scientific media.

[Course Schedule and Contents]
1) Introduction to Behavioral Neuroscience
2) Coarse anatomy of the nervous system
3) Cells in the nervous system
4) Neural information processing
5) Neurotransmitters, drugs, and hormones
6) Demonstration of Electroencephalography
7) Methods in Behavioral Neuroscience
8) Vision
9) Audition
10) Touch and pain
11) Integrating the senses
12) Attention
13) Voluntary body movement
14) Movement planning
15) Final examination
16) Feedback

[Class requirement]
Basic knowledge of high-school level biology is recommended. The course will continue in the following semester with "Introduction to Behavioral Neuroscience B".

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on class attendance and active participation (30 points), short student presentation or report (15 points), and a final examination (55 points). The final examination will test whether students have achieved the course goals. Students who are absent more than five times will not be credited.

Reference book
Bear, Connors, Paradiso Neuroscience: Exploring the brain ISBN:1451109547 (textbook not mandatory, lecture notes will be provided)

Reference book

Regarding studies out of class (preparation and review]
To achieve the course goals students should review the course materials plus optionally the according chapters in the recommended text books after each class. The time necessary for review should be in the range of 2-3 hours per class.

[Others (office hour, etc.)]
No fixed office hours, but students are welcome to arrange appointments by email.
Zoo Biology-E2(2)

[Textbook]
Instructed during class

[Reference book, etc.]

- An introduction to zoo biology and management (Wiley-Blackwell)
- Zoo Conservation Biology (Cambridge University Press)
- Zoo animals: behaviour, management, and welfare (Oxford University Press)

While there is no required textbook for this course, students are encouraged to sample from the reference materials listed, which form the basis for the lectures in the course.

[Regarding studies out of class (preparation and review)]
the instructor will provide instructions for how to prepare for this course once students have registered. There will be a small amount of preparatory reading to encourage students to engage with the course material.

[Others (office hour, etc.)]
This course has a 12-student maximum registration limit to facilitate group discussion and exercises during the zoo practicum. This course includes a mandatory 1 day practicum conducted at Kyoto City Zoo, in addition to the two day intensive lectures at the main campus. Students must be able to cover their own zoo admission fees and transportation to the site, and should ensure they have the necessary insurance.

Students are strongly encouraged to participate in class discussion and ask a lot of questions!

Course title: Zoo Biology-E2

[Affiliated department, Job title, Name]
Primate Research Institute
Associate Professor, Andrew MacIntosh

[Group]
Natural Sciences

[Field(Classification)]
Biology

[Language]
English

[Number of credits]
2

[Hours]
30

[Class style]
Lecture

[Course offered year/period]
2018 • Intensive, First semester

[Day/period]
Intensive

[Target year]
All students

[Eligible students]
For science students

[Course title] Zoo Biology-E2

[Group]
Natural Sciences

[Field(Classification)]
Biology

[Language]
English

[Old group] Group B

[Number of credits] 2

[Hours] 30

[Class style] Lecture

[Course offered year/period] 2018 • Intensive, First semester

[Day/period] Intensive

[Target year] All students

[Eligible students] For science students

[Outline and Purpose of the Course]
Zoos and aquariums are a window into nature and the exotic lives of animals. Everyone has been to a zoo and wondered at the animals on display, but what are zoos really about? What goes on behind the scenes? What role does a modern zoo play in our society, and how has this changed throughout history? This course is designed to answer just these questions. Along the way, you’ll learn about the modern missions of zoos, animal behavior and welfare, public outreach and education, and especially the conservation of endangered species.

[Course Goals]
In this course, students will learn to:
- appreciate and understand the role of zoos in modern society
- think critically about issues concerning zoos and aquariums and balance the costs and benefits of keeping animals in captivity
- assess the ‘quality of life’ of the animals they encounter at zoos and aquariums, and appreciate the diverse set of animal care and welfare challenges facing these institutions

[Course Schedule and Contents]
This is an intensive lectured tentatively scheduled for 3 days following the end of the first semester. Exact dates will be determined later in the year.

The course is organized into the following units:
1. history, philosophy and the modern missions of zoos
2. science at the zoo: basic research, biodiversity conservation, and environmental education
3. zoo ethics: animal behavior, welfare, enrichment and animal rights
4. zoo practical course: students

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
- attendance and class participation - 50%
- course wrap-up quiz - 25%
- practicum participation and report - 25%

Continue to Zoo Biology-E2(2)
Comparative cognition offers a ride through the mental capacities of animals as simple as the humble bumblebee and as complex as our own closest relative, the chimpanzee. In our quest to understand the origins of the human mind, we cannot forget that like all organisms on earth, we are but a small part of the great evolutionary tree of life. In this course, students learn about animal cognition through the lens of behavior, ecology and evolution. Students learn about how and why animals use their minds to navigate their physical and social worlds, and how and why they learn and remember things about their environments. The course has a strong emphasis on evolutionary theory, as well as the cognitive experiments that have allowed scientists to discover what we now know about the animal mind.

In this course, students will learn to:
- apply the scientific method to questions about intelligence and cognition to distinguish evidence-based statements about what animals are thinking from mere anthropomorphic descriptions or ‘just-so’ stories
- appreciate that human cognition - what and how we think and behave - is the product of a long evolutionary process that has acted in parallel on other species
- understand that cognition has both general (connected) and modular components, that there may be no such thing as a general intelligence, and that even the smallest of animals can surprise you with how they store and use information to solve problems that are important to them

Topics include (1) the evolution of the animal brain, (2) evolutionary and ecological pressures driving cognition; (3) sensing and perceiving the world around us, and (4) connecting the dots through learning & memory

Part 2 - finding our way in the physical world
Topics include (1) spatial cognition, (2) telling time & counting, and (3) foraging, planning & using tools

Part 3 - finding our way in the social world
Topics include (1) social cognition and social competence, (2) prosocial behavior, (3) social learning, and (4) communication & language

Part 4 - cognition, ethics & animal rights

The textbook may not be available at the university bookstore, but can be purchased from Amazon Japan or other third party online retailers, or directly from the publisher’s website.
Introduction to Evolution-E2

[Outline and Purpose of the Course]

All living things have evolved from common ancestors. Evolutionary biology studies the relationships within and between groups of organisms and also the process and mechanisms that lead to changes among groups of organisms. These mechanisms include inheritance, development, and natural selection. Organisms inherit traits from their ancestors and they express their traits as they develop into adults. Natural selection causes some of these traits to change over generations. Genetics has shed much light on inheritance while developmental biology has revealed many of the mechanisms by which organisms are built. Evolutionary biology integrates the interactions is genetics and developments in populations of organisms changing over time. In this course, we move from describing the evolutionary processes that contribute to populations and species evolving over time (microevolution) to examining evolution above the species level (macroevolution). We will then integrate the two to give an understanding on the history of life.

[Course Goals]

1) To gain an understanding of the processes that lead to evolutionary change within and between populations and species.
2) To be aware of the contemporary criticisms of evolutionary theory and understand why these criticisms are not valid.
3) To understand the contemporary debates within the field of evolutionary biology.
4) To learn that there are still many areas of vital and interesting research in evolutionary biology and also to critically think about data in order to derive valid conclusions.

[Course Schedule and Contents]

1) Introduction, history of the idea of evolution, and challenges to evolution
2) Microevolutionary concepts: Adaptive and neutral evolution
3) Microevolutionary concepts: The genetic impact of selection on populations
4) Microevolutionary concepts: The importance of development
5) Microevolutionary concepts: The origin, maintenance, and expression of variation
6) Sexual selection
7) The evolution of sex and genomic conflict
8) Macroevolutionary concepts: Speciation
9) Macroevolutionary concepts: Case study of Darwin’s finches
10) Macroevolutionary concepts: Phylogeny, systematics, and the comparative method in evolutionary biology
11) Key events in evolution and the fossil record
12) Coevolution
13) Human evolution
14) Evolutionary medicine
15) Final Exam
16) Feedback

Lecture code: N906001

[Class requirement]
Understanding of high school biology is recommended.

[Method, Point of view, and Attainment levels of Evaluation]
Assessment will comprise of class attendance and completion of quizzes (10%), assignments (40%), and a final examination (50%). The final examination will test whether students have achieved the course goals. Students who are absent more than five times will not be credited.

[Textbook]
Not fixed.

[Reference book, etc.]
P. R. Grant and B.R. Grant 『How and Why Species Multiple: The Radiation of Darwin’s Finches』 (Princeton University Press)
D. J. Futuyma 『Evolution. 3rd Edition』 (Sinauer Associates)

[Regarding studies out of class (preparation and review)]
To achieve the course goals students should review the course materials plus optionally the according chapters in the recommended text books after each class. The time necessary for review should be in the range of 2-3 hours per class.

[Others (office hour, etc.)]

Continue to Introduction to Evolution-E2(2)
**Course title**
Practical Computing for Biologists-E2

**Affiliated department, Job title, Name**
Graduate School of Biostudies, Associate Professor, CARLTON, Peter

**Group**
Natural Sciences

**Field(Classification)**
Biology(Issues)

**Language**
English

**Old group**
Group B

**Number of weekly time blocks**
1

**Class style**
Lecture

**Number of credits**
2

**Course offered year/period**
2018 * Second semester

**Eligible students**
For science students

**Target year**
Mainly 1st & 2nd year student

### [Outline and Purpose of the Course]

This class will introduce students to basic but powerful computational tools that are increasingly becoming an essential part of biological research. We will explore some useful open source software for DNA and protein analysis, and additional programs for analyzing biological images. Each class will start with a background lecture and proceed to hands-on use. The aim of the class is to provide an introduction that will enable further exploration of computational biology.

### [Course Goals]

- To discover current bioinformatics and biological image analysis software
- To be able to design analyze DNA sequences using open online software
- To learn general principles of programming using the Python language
- To develop a foundation for further exploration of the exciting world of bioinformatics

### [Course Schedule and Contents]

1. Overview of the course. How are computers used in biology?
2. Getting the computer to do stuff: introduction to the "Shell" (terminal)
3. Introduction to text files and DNA sequence text files
4. The EMBOSS molecular biology suite: Overview of DNA sequence features
5. Searching for sequences within the human genome and proteome
6. Working with DNA sequences: introduction to Benchling
7. DNA cloning (making a new DNA sequence from existing ones)
8. Molecular scissors: introduction to genome engineering with CRISPR/Cas9
9. Introduction to R, a language for statistical computing
10. Beginning programming with Python, a general computer language that can be adapted for biology
11. Searching DNA sequences with Python
12. Imaging for biologists: Image fundamentals (pixels, intensity, scaling) using Fiji
13. Measuring objects in your images
14. Calculating the speed of moving particles using image analysis

### [Class requirement]

A laptop computer with a wireless internet connection is highly recommended. Windows users should install the program "putty" (from http://www.putty.org) to connect to the class server; Mac and UNIX users can use the built-in terminal program. Provisions can be made for students who do not have their own laptop.

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**Practical Computing for Biologists-E2(2)**

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

Grading will be based on three areas: active participation, quizzes (including homework), and a final exam. Each area will contribute 1/3rd of the total grade.

### [Textbook]


(Note: Textbook purchase is suggested but optional. See also the companion website at http://practicalcomputing.org)

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

Students will have to understand technical vocabulary in English. This may require studying and research outside of class hours.

### [Others (office hour, etc.)]

Office hours will be 1 hour once per week, schedule to be announced on the first day of class.

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Lecture code: N907001
Course title: Principles of Horticulture-E2

Affiliated department: Graduate School of Agriculture

Job title: Associate Professor

Name: Garry John PILLER

Group: Natural Sciences

Field (Classification): Biology

Language: English

Old group: Group B

Number of credits: 2

Number of weekly time blocks: 1

Class style: Lecture

Course offered year/period: 2018 • Second semester

Day/period: Wed.3

Target year: Mainly 1st & 2nd year student

Eligible students: For science students

[Outline and Purpose of the Course]

This course is a broad introduction to the science and technology underlying the use and production of horticultural crops (fruits, vegetables, flowers, and landscape plants). It includes the structure; growth, development and manipulation of horticultural plants; environmental influences; the basic principles of propagation, outdoor and greenhouse production; and pest control.

[Course Goals]

Upon successful completion of this course students will:

• Be able to use basic horticultural vocabulary to describe and define horticultural management activities.
• Demonstrate a working knowledge of growth and development patterns of horticultural crops, and responses to environmental variables.
• Be able to access and understand basic research on horticultural crops.

[Course Schedule and Contents]

Course Schedule
1. Introduction/ History
2. Plant Structure & Genotype
3. Flowers & Fruits
4. Propagation
5. Light
6. Temperature
7. Water
8. Soils & Soil Management
9. Mineral Nutrition
10. Plant Hormones
11. Directing Plant Growth
12. Pest & Disease Management
13. Greenhouse Production
14. Post Harvest Handling
15. End Exam
16. Feedback

[Class requirement]

None

Principles of Horticulture-E2(2)

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

Grading: Class attendance, active participation land listening quizzes (20%), weekly quizzes based on assigned pre-class reading materials (30%), in-class group presentation (20%), and final exam (30%).

[Textbook]

Not used

[Reference book, etc.]

(Reference book)

Handouts and supplemental readings will be distributed electronically and/or as a hard copy in class.

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

Students should read or listen to the required pre-class materials and submit any required assignment before the class, and come to class ready to participate in class activities. Typically, this will entail listening to a short video or podcast (10 min. or less), as well as reading a 2 or 3 page handout and be prepared to write answers to 1 or 2 questions about the reading material in the following class (15 to 20 minutes provided in class).

[Others (office hour, etc.)]

Open door policy during office hours, and anytime by email.

Lecture code: N495001
### Course title
Molecular and Cell Biology of Reproduction-E2

### Affiliated department, Job title, Name
Graduate School of Agriculture, Associate Professor, GOEL, Sandeep

### Group
Natural Sciences

### Field(Classification)
Biology(Issues)

### Language
English

### Old group
Group B

### Number of weekly time blocks
1

### Class style
Lecture

### Course offered year/period
2018 • Second semester

### Day/period
Wed. 2

### Target year
Mainly 2nd year students

### Eligible students
For science students

### [Outline and Purpose of the Course]

Reproduction is a sequence of events beginning with the development of the reproductive system in the embryo. Reproduction is a fundamental feature of living beings. The purpose of this course is to educate the students about the underlying molecular and cellular mechanisms of the reproductive process. The lecture series will also cover the regulatory pathways involved in the reproductive process, transgenesis, reproductive cloning and assisted reproductive techniques.

### [Course Goals]

The course intends to educate the students about the basic cell and molecular biology of the reproductive process. This would serve as a foundation for their future research interests.

### [Course Schedule and Contents]

1. Introduction
2. Origin and specification of germ cells
3. Sexual differentiation and development
4. Regulation of reproduction (nerve, hormone and target tissues)
5. Spermatogenesis
6. Oogenesis/folliculogenesis
7. Gamete transport and fertilization
8. Implantation, pregnancy and embryonic development
9. Genetic and endocrine disorders of reproduction
10. Fertility and its control (2 weeks)
11. Stem cells of the reproduction
12. Infertility and its remedies
13. Cloning and Transgenesis
14. Feedback (To be announced in the class)

### [Class requirement]

Students with a basic understanding of biology will be preferred.

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

The students will be assessed based on assignments (2, 10 points each), quizzes (5, 10 points each), and discussions (30 points) in the class.

### [Textbook]

The class presentation will be emailed to the students for reference and preparation for the quiz. Handouts will also be provided if requested for.

### [Reference book, etc.]

Jones and Lopez • Human Reproductive Biology

Students will be provided with presentations (soft copy in their email or in the KULASIS) after the class.

### [Related URL]

http://www.reprod.kais.kyoto-u.ac.jp/(Laboratory Home Page)

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

Students will be provided with presentations after the class and are expected to read it. Salient points of the presentation from previous class will be discussed, before starting the next class.

### [Others (office hour, etc.)]

By appointment (To be announced in the class).

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Lecture code: N921001
Introduction to Genetics and Evolution-E2

Outline and Purpose of the Course
This class will provide a basic introduction to genetics and molecular genetics, starting with familiar topics. What are chromosomes? How do cats get six toes? We will learn some of the basics about DNA, the genetic material; concepts of dominant and recessive modes of inheritance; various model organisms, and then we will progress to more specific topics, such as human genetics, how genes are regulated, how genetic variation is maintained in populations, and evolution.

Course Goals
Students will become familiar with "classical" genetics, where mutations come from, genetic linkage and gene mapping, population genetics, and a brief introduction to current topics such as human genetics, gene therapy, genetically modified organisms and evolution.

Course Schedule and Contents
Second Semester, Mondays, 13:00-14:30
1. The Structure of DNA and chromosomes
2. Heritability and Independent Assortment--how do chromosomes segregate
3. The source of genetic variation: Mutations and Rearrangements
4. Genetics of Bacteria and Bacteriophages
5. Eukaryotic Genetics, Model Organisms: plants, flies, worms, mice, etc.
6. Linkage and Recombination
7. Transposable Elements
8. Organelles: mitochondrial genes; chloroplast genes.
9. Human Genetics: human genetic diseases, and other topics
10. Cancer Genetics: familial colon cancer. Loss of heterozygosity, etc.
11. Imprinting
12. Reverse Genetics, Genetic engineering, and GMOs
13. Gene Therapy
14. Population Genetics and Evolution
15. Final Exam
16. Feedback Class

Note: schedule is subject to change

Class requirement
This is an introductory course. There are no requirements, but some basic familiarity with biology will be beneficial. The course will be taught entirely in English. For some students, they will already have some knowledge of Genetics but maybe not in English. For other students, perhaps they will have good English skills, but will have to learn the specialized vocabulary of Genetics.

Method, Point of view, and Attainment levels of Evaluation
The final grade will be based on mini-quizzes (30 points) to assess comprehension and a final exam (30 points). Attendance and participation (40 points) will also factor into the final grade.

Textbook
Hartl "Essential Genetics 6th ed." (Jones and Bartlett Learning) ISBN:978-1-4496-8688-8 (Recommended but not strictly required.)

Reference book

Regarding studies out of class (preparation and review)
Students may need 2-3 hours per week to review the lecture material and look up any background information as necessary. Some students may know the subject already, but need to learn the English vocabulary; others may need to learn both Biology and English.

Others (office hour, etc.)
I will provide handouts for each lecture. I will try to post these on Kulasis ahead of time so that you can study before the lecture. Office hours are Mondays from 10:00-12:00, but you may stop by my office any time, if I am there.
Basic Genetic Engineering-E2

Course title: Basic Genetic Engineering-E2
Affiliated department: Graduate School of Biostudies
Job title: Professor
Name: HEJNA, James

Group: Natural Sciences
Field (Classification): Biology (Issues)
Language: English
Old group: Group B
Number of credits: 2

Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • Second semester

Day/period: Wed. 2
Target year: Nearly 1st & 2nd year student
Eligible students: For science students

[Outline and Purpose of the Course]
The objective of this course is to gain a familiarity with the methods, resources, and molecular tools that enable biologists to conduct their research. We will cover basic cloning strategies, expression systems, and applications that are widely used. The course is intended for 1st and 2nd year students, to provide an introduction to genetic engineering, which will serve as a foundation for more advanced courses.

[Course Goals]
Students will acquire familiarity with routine subcloning, mutagenesis, reporter constructs, epitope tags, silencing, PCR, and other important techniques. Although this is not a wet lab, we will learn by actually designing genetic engineering projects. Depending on enrollment, we may work in small groups or all together to plan a genetic engineering project, step by step.

[Course Schedule and Contents]
First Semester, Wednesdays, 10:30-12:00
1. Overview, types of genetic engineering, biosafety
2. Basic Tools: cutting and pasting
3. Bioinformatics tools
4. Propagating DNA constructs
5. PCR, primer design and amplification tips
6. Purification of DNA and RNA
7. DNA libraries
8. The when, where, how, (and why?) of expression
9. Making proteins visible
10. Tools for reverse genetics
11. Editing the genome
12. New approaches to cutting and pasting
13. Knocking down genes
14. Transgenic plants, mice, and gene therapy
15. Final Exam
16. Feedback Class

Second Semester, Wednesdays, 10:30-12:00
1. Overview, types of genetic engineering, biosafety
2. Basic Tools: cutting and pasting
3. Bioinformatics tools
4. Propagating DNA constructs
5. PCR, primer design and amplification tips
6. Purification of DNA and RNA
7. DNA libraries
8. The when, where, how, (and why?) of expression
9. Making proteins visible
10. Tools for reverse genetics
11. Editing the genome
12. New approaches to cutting and pasting
13. Knocking down genes
14. Transgenic plants, mice, and gene therapy
15. Final Exam
16. Feedback Class

[Class requirement]
The course is designed for 1st and 2nd year students, from all backgrounds. Recombineering is conceptually not difficult. The vocabulary will get a bit technical, but with some effort, non-biology students should understand most of the course.

[Method, Point of view, and Attainment levels of Evaluation]
Final grades will be based on quizzes (20 points), a final presentation (20 points), and attendance and participation (60 points).

[Textbook]
Not used
I will teach you how to use many online sources and freeware to work with DNA sequences, vectors, cloning, etc.

[Reference book, etc.]

[Regarding studies out of class (preparation and review)]
As we get into individual or team cloning projects, some outside reading or planning may be necessary, roughly 1-2 hours per week.

[Others (office hour, etc.)]
I will combine short mini-lectures with in-class work in teams so that you actively learn how to use some of the design tools and strategies for genetic engineering.

Office hours: Mondays, 10:00-12:00. I am often in my office, so you may drop by; if I am there, we can talk. Students may need to spend some time working on their independent projects outside of class, although about half of each class will be spent on the group projects. Students should bring a laptop or pad with internet access so that they can work in class.
# Introduction to Biochemistry-E2(2)

## [Outline and Purpose of the Course]

This introductory course focuses on the basic concepts of biochemistry. It begins from the molecular design of life and considers its major players; nucleic acids as the genetic material, and then proteins, enzymes, carbohydrates, lipids and cell membranes. Based on these preliminary concepts, the course then continues to consider the basic processes involved in metabolism and energy generation in living organisms.

## [Course Goals]

To appreciate that by understanding some of the underlying concepts and principles of the molecular and biochemical processes that control life, we can more easily comprehend the complexities of diverse biological and physiological systems.

## [Course Schedule and Contents)]

**Main Topics:**
1. Introduction to biochemistry, an evolving science
2. Genomes, DNA and DNA replication
3. Genes and gene expression
4. Protein composition and structure
5. Exploring DNA and genes
6. Exploring proteins
7. Introduction to enzymes
8. Carbohydrates
9. Lipids and cell membranes
10. Introduction to metabolism
11. Glycolysis
12. Gluconeogenesis
13. Citric acid cycle
14. Oxidative phosphorylation
15. Final examination
16. Feedback discussions

## [Class requirement]

None

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Lecture code: N490002
Course title: Introduction to Biochemistry-E2

Introduction to Biochemistry-E2

Affiliated department, Job title, Name
Graduate School of Medicine, Senior Lecturer, Marco Marques Candeias

Group
Natural Sciences

Field(Classification)
Biology(Issues)

Language
English
Old group
Group B
Number of credits
2

Number of weekly time blocks
1

Class style
Lecture

Course offered year/period
2018 • Second semester

Day/period
Tue.3

Target year
Mainly 1st & 2nd year students

Eligible students
For science students

Outline and Purpose of the Course
This introductory course focuses on the basic concepts of biochemistry. It begins from the molecular design of life and considers its major players; nucleic acids as the genetic material, and then proteins, enzymes, carbohydrates, lipids and cell membranes. Based on these preliminary concepts, the course then continues to consider the basic processes involved in metabolism and energy generation in living organisms.

Course Goals
To appreciate that by understanding some of the underlying concepts and principles of the molecular and biochemical processes that control life, we can more easily comprehend the complexities of diverse biological and physiological systems.

Course Schedule and Contents
Main Topics:
1. Introduction to biochemistry, an evolving science
2. Genomes, DNA and DNA replication
3. Genes and gene expression
4. Protein composition and structure
5. Exploring DNA and genes
6. Exploring proteins
7. Introduction to enzymes
8. Carbohydrates
9. Lipids and cell membranes
10. Introduction to metabolism
11. Glycolysis
12. Gluconeogenesis
13. Citric acid cycle
14. Oxidative phosphorylation
15. Final examination
16. Feedback discussions

Class requirement
None

Method, Point of view, and Attainment levels of Evaluation
Evaluation will be based on class attendance and active participation (~20%), mid-course tests (~30%) and a final examination (~50%)

Textbook

Reference book, etc.
Introductory during class

Regarding studies out of class (preparation and review)
*Full lecture handouts will be provided one week before each lecture, and will also be uploaded on KULASIS. It is expected that students will have read through the handouts at least once before each lecture to familiarize themselves with the contents. During the lecture, active listening and participation (e.g. by asking questions) will ensure a greater understanding of the basic concepts. Finally, and most importantly, a private review of the handout immediately after the lecture will ensure a full and solid understanding of the lecture concepts.

*The course will be associated with a new series of small-group, weekly seminars that will help students obtain a deeper understanding of the basic concepts

Others (office hour, etc.)
*The course is presented as a series of engaging and active lectures with demonstrations and video presentations.
*Questions and discussions during class are highly encouraged.
*We run an open door policy; questions and discussions will be happily addressed anytime, even outside the official office hour.

Lecture code: N490004
Have you ever wondered why aspirin relieves pain or why some pesticides are toxic to insects? This course is designed to teach students how to explore such questions through computational means. Students will investigate molecular structures, functions, and interactions on an atomistic level in a playful way. Although topics will be introduced at a beginner’s level and students from all disciplines are encouraged to participate, prior knowledge about basic molecular biology is advantageous. The lectures provide insights into theoretical biophysics, computer-based approaches, and molecular modelling tools. At the core of this course is a project in which students develop a research hypothesis and apply computational workflows to analyze and explore a biological question of their own interest. This project will give students the opportunity to practice scientific writing and presentation skills.

**Course Goals**

Students of this course will
- gain deeper understanding about the structure and function of (macro)molecules and the theoretical basis of molecular interactions
- learn how to execute and apply computational workflows for molecular analysis and visualization
- become conversant with the theory and execution of molecular modelling calculations and simulations
- learn how to write scientific reports or present scientific research results

**Course Schedule and Contents**

(The order and depths of topics may be subject to change depending on the students’ feedback, learning progress, and levels of proficiency)

1. Introduction to molecular structures, biophysical principles, and biological data
2. Molecular modelling basics (visualization concepts, methodologies, and software)
3. Exploration of proteins and their motions (molecular dynamics simulations)
4. Investigating molecular interactions (molecular docking simulations, 3D pharmacophores)
5. Chemical space exploration (chemoinformatics, QSAR)
6. Project-based counselling and discussion of questions
7. Project presentations or submission of course reports
8. Feedback

---

**Outline and Purpose of the Course**

Access to a computer is essential to conduct the project. The course projects will be executed in groups of 1 to 3 students and group-internal meetings have to be scheduled independently and outside of class to design and execute the course projects, and prepare for the final presentation or course report.

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

- 40% Class attendance/ participation
- 40% Quality of research project
- 20% Final presentation/ course report

**Textbook**

The following books give deeper insights into presented topics, but are no mandatory prerequisites to successfully complete the course.


**Reference book, etc.**

- Introduced during class

**Related URL**

(Announced during class.)

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

Weekly review of course content is advised. Handouts will be provided by the instructor. The design and execution of the course project, as well as the preparation of the final presentation or course report, require additional time investment outside of class.

**Others (office hour, etc.)**

Announced during class.
Introduction to Biochemistry-E2

[Outline and Purpose of the Course]
This introductory course focuses on the basic concepts of biochemistry. It begins from the molecular design of life and considers its major players: nucleic acids as the genetic material, and then proteins, enzymes, carbohydrates, lipids and cell membranes. Based on these preliminary concepts, the course then continues to consider the basic processes involved in metabolism and energy generation in living organisms.

[Course Goals]
To appreciate that by understanding some of the underlying concepts and principles of the molecular and biochemical processes that control life, we can more easily comprehend the complexities of diverse biological and physiological systems.

[Course Schedule and Contents]
Main Topics:
1. Introduction to biochemistry, an evolving science
2. Genomes, DNA and DNA replication
3. Genes and gene expression
4. Protein composition and structure
5. Exploring DNA and genes
6. Exploring proteins
7. Introduction to enzymes
8. Carbohydrates
9. Lipids and cell membranes
10. Introduction to metabolism
11. Glycolysis
12. Gluconeogenesis
13. Citric acid cycle
14. Oxidative phosphorylation
15. Final examination
16. Feedback discussions

[Class requirement]
None

Introduction to Biochemistry-E2(2)

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on class attendance and active participation (~20%), mid-course tests (~30%) and a final examination (~50%).

[Textbook]

[Reference book, etc.]
Introduced during class

[Regarding studies out of class (preparation and review)]
*Full lecture handouts will be provided one week before each lecture, and will also be uploaded on KULASIS. It is expected that students will have read through the handouts at least once before each lecture to familiarize themselves with the contents. During the lecture, active listening and participation (e.g. by asking questions) will ensure a greater understanding of the basic concepts. Finally, and most importantly, a private review of the handout immediately after the lecture will ensure a full and solid understanding of the lecture concepts.

*The course will be associated with a new series of small-group, weekly seminars that will help students obtain a deeper understanding of the basic concepts

[Others (office hour, etc.)]
*The course is presented as a series of engaging and active lectures with demonstrations and video presentations.
*Questions and discussions during class are highly encouraged.
*We run an open door policy; questions and discussions will be happily addressed anytime, even outside the official office hour.
**Course title**: Introduction to Biochemistry-E2

**Introduction to Biochemistry-E2**

**Affiliated department, Job title, Name**
Graduate School of Medicine
Professor, Shohab YOUSSEFIAN

**Group**: Natural Sciences  
**Field(Classification)**: Biology  
**Language**: English  
**Old group**: Group B  
**Number of credits**: 2

**Number of weekly time blocks**: 1  
**Class style**: Lecture  
**Course offered year/period**: 2018 • Second semester

**Day/period**: Tue.3  
**Target year**: Mainly 1st & 2nd year students  
**Eligible students**: For science students

**[Outline and Purpose of the Course]**
This introductory course focuses on the basic concepts of biochemistry. It begins from the molecular design of life and considers its major players; nucleic acids as the genetic material, and then proteins, enzymes, carbohydrates, lipids and cell membranes. Based on these preliminary concepts, the course then continues to consider the basic processes involved in metabolism and energy generation in living organisms.

**[Course Goals]**
To appreciate that by understanding some of the underlying concepts and principles of the molecular and biochemical processes that control life, we can more easily comprehend the complexities of diverse biological and physiological systems.

**[Course Schedule and Contents]**
Main Topics:
1. Introduction to biochemistry, an evolving science
2. Genomes, DNA and DNA replication
3. Genes and gene expression
4. Protein composition and structure
5. Exploring DNA and genes
6. Exploring proteins
7. Introduction to enzymes
8. Carbohydrates
9. Lipids and cell membranes
10. Introduction to metabolism
11. Glycolysis
12. Gluconeogenesis
13. Citric acid cycle
14. Oxidative phosphorylation
15. Final examination
16. Feedback discussions

**[Class requirement]**
None

**[Method, Point of view, and Attainment levels of Evaluation]**
Evaluation will be based on class attendance and active participation (~20%), mid-course tests (~30%) and a final examination (~50%).

**[Textbook]**
ISBN:978-1-4292-7635-1

**[Reference book, etc.]**
Introduced during class

**[Regarding studies out of class (preparation and review)]**
*Full lecture handouts will be provided one week before each lecture, and will also be uploaded on KULASIS. It is expected that students will have read through the handouts at least once before each lecture to familiarize themselves with the contents. During the lecture, active listening and participation (e.g. by asking questions) will ensure a greater understanding of the basic concepts. Finally, and most importantly, a private review of the handout immediately after the lecture will ensure a full and solid understanding of the lecture concepts.*

*The course will be associated with a new series of small-group, weekly seminars that will help students obtain a deeper understanding of the basic concepts*

**[Others (office hour, etc.)]**
*The course is presented as a series of engaging and active lectures with demonstrations and video presentations.*
*Questions and discussions during class are highly encouraged.*
*We run an open door policy; questions and discussions will be happily addressed anytime, even outside the official office hour.*

---

**Introduction to Biochemistry-E2(2)**

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

**[Course Goals]**

**[Course Schedule and Contents]**

**[Textbook]**

**[Reference book, etc.]**

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

**[Others (office hour, etc.)]**
**Course title**
Biological Sciences through Scientific Articles II-E2

**Affiliated department, Job title, Name**
Graduate School of Science
Associate Professor, TAKENAKA, Mizuki

<table>
<thead>
<tr>
<th>Group</th>
<th>Natural Sciences</th>
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<tbody>
<tr>
<td>Field (Classification)</td>
<td>Biology (Issues)</td>
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<tr>
<td>Language</td>
<td>English</td>
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<td>Old group</td>
<td>Group B</td>
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<tr>
<td>Class style</td>
<td>Seminar</td>
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<tr>
<td>Course offered year/period</td>
<td>2018 • Second semester</td>
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<tr>
<td>Day/period</td>
<td>Tue. 5</td>
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<tr>
<td>Target year</td>
<td>1st &amp; 2nd year students</td>
</tr>
<tr>
<td>Eligible students</td>
<td>For all majors</td>
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**[Outline and Purpose of the Course]**

In this seminar course, we will read various biological reviews, articles, and essays in turn in English. Students will be expected to deeply understand their contents. Supporting information like a scientific background, histories or experimental methods will be provided as needed. If necessary, short complementary comments in Japanese will be also available. Lesson materials used for the seminar course will be different from the second term.

**[Course Goals]**

- Students will learn how to read scientific reviews, essays, and articles.
- To grasp the essence of the article and summarize it efficiently.
- To find interesting points in scientific articles.
- To find complementary articles if necessary.
- To read articles critically and purposefully.

**[Course Schedule and Contents]**

1) In the first week, I will give an instruction of the seminar course. I will discuss an article to show the style of presentation. Then each week, several biological articles (especially from plant science) to be prepared for a later week will be presented to one of the students, who can make the choice based on his or her preference.

2)-14) Each student prepares a presentation about the article with support of me if necessary and presents it at the seminar in turn. Other students are expected actively to join the discussion. Complementary information for the article will be provided as needed.

15) I will provide a course summary for the feedback session.

**[Class requirement]**

None

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

Class attendance and active participation (70%), Presentation following questions and answer session (30%).

**[Textbook]**

Instructed during class

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

Students should read the provided article in advance.

**[Others (office hour, etc.)]**

Contact: mizuki.takenaka@pmg.bot.kyoto-u.ac.jp
Any questions and requests are welcome by prior arrangements via E-mail.

Lecture code: N926001
**Course Goals**

1. To understand the function of the major organ systems and how they work together.
2. To develop a vocabulary of anatomy and physiology.
3. To interpret everyday life physiology.

**Course Schedule and Contents**

(1) Introduction
(2) Cells
(3) Tissues

PART II. Support & Movement
(4) Skeletal System
(5) Muscular System

PART III. Regulation, Integration, & Control
(6) Nervous System
(7) Senses
(8) Endocrine System

PART IV. Fluids & Transport
(9) Cardiovascular System
(10) Blood

PART V. Energy, Maintenance, & Environmental Exchange
(11) Respiratory System
(12) Digestive System
(13) Urinary System

(14) Review

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**Outline and Purpose of the Course**

This course covers the basic background required to understand how the major organ systems of the human body perform their normal functions and how they work together to maintain our health. Students will connect the knowledge learned in the class to their everyday life, and further use their imagination to design a new additional organ system for the human body (present their designs in a written report or YouTube video). This class aims primarily at students who have minimal to no biology background.

**Course Schedule and Contents**

(1) Introduction
(2) Cells
(3) Tissues

PART II. Support & Movement
(4) Skeletal System
(5) Muscular System

PART III. Regulation, Integration, & Control
(6) Nervous System
(7) Senses
(8) Endocrine System

PART IV. Fluids & Transport
(9) Cardiovascular System
(10) Blood

PART V. Energy, Maintenance, & Environmental Exchange
(11) Respiratory System
(12) Digestive System
(13) Urinary System

(14) Review
Course title: Introduction to Behavioral Neuroscience B-E2

Affiliated department, Job title, Name: Graduate School of Medicine Assistant Professor, VEALE, Richard Edmund

Group: Natural Sciences
Field(Classification): Biology(Issues)

Language: English
Old group: Group B
Number of credits: 2

Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • Second semester

Day/period: Fri.5
Target year: All students
Eligible students: For all majors

[Outline and Purpose of the Course]
Behavioral Neuroscience investigates the neural basis of behavior. Part B of this course will provide an introduction to higher brain functions, such as motivation, learning, memory, communication and language. The course will employ an integrative approach by discussing both research results obtained with brain imaging in humans and experiments in animal models.

[Course Goals]
- To understand how our brain generates complex behavior.
- To understand how we can apply basic research in behavioral neuroscience to our everyday life.
- To be able to critically evaluate research findings in behavioral neuroscience reported in the public and scientific media.

[Course Schedule and Contents]
1) Introduction to higher brain functions
2) Motivation
3) Learning
4) Memory
5) Spatial memory and navigation
6) Executive functions and planning
7) Emotions
8) Reproductive behavior
9) Communication and language
10) Human language and language disorders
11) Social interaction
12) Evolution and development of behavior
13) Neurological and psychiatric disorders
14) Behavioral treatment strategies
15) Final examination
16) Feedback

[Class requirement]
Introduction to Behavioral Neuroscience A is recommended (but not mandatory), because it provides the fundamental knowledge for this course.

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on class attendance and active participation (30 points), short student presentation or report (15 points), and a final examination (55 points). The final examination will test whether students have achieved the course goals. Students who are absent more than five times will not be credited.

[Textbook]
Bear, Connors, Paradiso. Neuroscience: Exploring the brain. (Lippincott) ISBN:1451109547 (textbook not mandatory, lecture notes will be provided)

[Reference book, etc.]

[Regarding studies out of class (preparation and review)]
To achieve the course goals students should review the course materials plus optionally the according chapters in the recommended text books after each class. The time necessary for review should be in the range of 2-3 hours per class.

[Others (office hour, etc.)]
No fixed office hours, but students are welcome to arrange appointments by email.
[Outline and Purpose of the Course]
The purpose of this course is to provide fundamentals of current biology, in particular focused on micro-level biology below the cell level with an "Essential cell biology," which is a university level standard textbook. Students will learn the functions of characteristic molecules of life such as DNA, RNA and proteins in the cell. Furthermore, how structural features of these molecules contribute their respective functions will be discussed. This course will also cover the relevance between the functions of these biological molecules and various life phenomena at the cell or individual organism level.

[Course Goals]
This course will provide a fundamental understanding of molecular and cell biology. Students will be able to explain how the cell is organized and how it functions in English.

[Course Schedule and Contents]
1. Cells: The Fundamental Units of Life
2. Chemical Components of Cells
3. Protein Structure and Function
4. DNA Replication, Repair, and Recombination
5. From DNA to Protein: How Cells Read the Genome
6. How Genes and Genomes Evolve
7. Membrane Structure
8. Transport Across Cell Membranes
9. Energy Generation in Mitochondria and Chloroplasts
10. Intracellular Compartments and Protein Transport
11. Cell Signaling and Cytoskeleton
12. The Cell Division Cycle
14. Cellular Communities: Tissues, Stem Cells, and Cancer

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Class attendance and active participation (20%), weekly small test (10%) a oral exam (10%) and a final written exam (60%)
In this lecture series, the basics of the survival strategy of plants will be learned at the cellular and molecular level. Despite that the achievement of plant science are very frequently described in high school textbooks, university students have very few opportunities to study them unless they specifically learn plant physiology. In this classes, the contents of plant science, which are mentioned only widely and shallowly at high school level will be provided more deeply with the latest knowledge.

**Course Goals**

To understand the fundamentals of plant physiology 
To understand how plants use light-energy. 
To understand the signal transduction in plants. 
To understand the basics of plant development and reproduction

**Course Schedule and Contents**

1)Plant and cell architecture 
2)Genome structure and gene expression 
3)Water in plants 
4)Mineral Nutrition 
5)Photosynthesis 
6)Cell wall 
7)Signal transduction 
8)Embryogenesis 
9)Seed dormancy germination and seedling 
10)Vegetative growth and organogenesis 
11)Flower controlling. 
12)Gametophytes pollination , seeds, and fruits 
13)Plant senescence and cell death 
14)Biotic and Abiotic interaction

**Class requirement**

None

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

Class attendance and active participation (20%), weekly small test 10% a oral exam (10%)and a final written exam (60%)

Contact: mizuki.takenaka@pmg.bot.kyoto-u.ac.jp

Any questions and requests are welcome by prior arrangements via E-mail.

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**Textbook**


**Reference book, etc.**

Summary of the lecture contents will be provided at the class.

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

Reading the textbook before the lecture will help the students to understand the lecture.
Students should review the textbook after the lecture.

**Others (office hour, etc.)**

Contact: mizuki.takenaka@pmg.bot.kyoto-u.ac.jp
Any questions and requests are welcome by prior arrangements via E-mail.
How the Earth Works I-E2 : Environmental Change

Overview

I will outline the environmental changes that have occurred during the Earth history, with a special focus on climate change. The lectures will address the main factors that control the climate, as well as their interaction. We will discuss in particular the human impact on environment and its consequences. To facilitate understanding and encourage active participation during the class, some materials and vocabulary in Japanese will be also provided.

Course Goals

The Earth Climate is the result of complex interactions among the components that make up the Earth: the Atmosphere (layer of gases), the Hydrosphere (water), the Lithosphere (or solid Geosphere), and the Biosphere (all living organisms). By learning about these interactions that take place on a variety of time scales, the students will be able to understand why and how the Earth Climate continuously changes.

Course Schedule and Contents

During its history of 46 billion years, the Earth climate changed profoundly. At the scale of hundreds of millions of years, the Earth is now during an "Ice Age" period. However, at a 'closer' look, at the scale of hundreds of thousands of years, we are at present in a period of relative warming known as "interglacial period". From the early part of the 19th century, the human activity started having a pronounced impact on climate, being likely responsible for the current "global warming", due to high emission of greenhouse gases.

Contents (tentative):
- Components of the climate system;
- Current global environment: the Earth's energy balance;
- Origins and evolution of the Atmosphere, Hydrosphere and Continents;
- Climate change factors: the carbon cycle;
- Long-term and short-term climate changes from past to present;
- 20th century warming: fingerprints of human-related global climate change.

There will be 2-3 lectures for each of the topics above.

Class Requirement

None
Introduction to Earth Science A(2)

[Course title]
Introduction to Earth Science A

[Course offered year/period]
2018 • First semester

[Target year]
Mainly 1st year students

[Number of credits]
2

[Group]
Natural Sciences

[Field(Classification)]
Earth Science(Foundations)

[Language]
English

[Group B]
Old group

[Number of weekly time blocks]
1

[Class style]
Lecture

[Course offered year/period]
2018 • First semester

[Day/period]
Fri.2

[Eligible students]
For science students

[Outline and Purpose of the Course]

Year after year, the effects of climate change (extreme heat waves, rising sea-levels, changes in patterns of precipitation, floods, droughts, intense hurricanes, etc.) are increasingly affecting--directly and indirectly--the physical, social, and psychological health of humans.

As a student of sciences, you will be responsible--at some point of your future professional career, be it in the public or private sector--to devise strategies, methods, and/or techniques to mitigate its effects, either globally or locally. But, in order to do so, you first need to understand how our planet works, how its diverse parts are interrelated, and how changes in the working of some of its elements could disrupt complete systems.

This lecture will introduce, therefore, the tools needed to study the Earth as a system, and will focus on three of its main subsystems (Atmosphere, Hydrosphere, and Geosphere) and their interactions in different time scales.

[Course Goals]

At the end of the semester, you should be able to understand the concept of systems, the basics of our planet's energy balance, and also the principles behind the behavior--as systems and subsystems--of the Atmosphere, the Hydrosphere, and the Geosphere.

[Course Schedule and Contents]

The Earth System is broadly divided into four subsystems: Atmosphere, Hydrosphere, Geosphere, and Biosphere. There is exchange of both matter and energy within those subsystems, in different time scales.

The main contents of this lecture are:
1. Introduction to Earth Systems
2. Global Energy Balance
3. Atmosphere
4. Hydrosphere
5. Geosphere

The contents of each topic will be delivered in two or three lectures each. At the end of each topic, you will be requested to submit a corresponding report. At the end of the semester we will have one final feedback session (details will be given in class).

[Class requirement]

None

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

Submission of a report will be requested after finishing each of the main five topics. Deadlines will be strictly enforced. No exams will be taken. Details will be explained during the first lecture.

[Textbook]

Handouts will be provided for each class.

[Reference book, etc.]

Brian J. Skinner, Barbara Murck 『The Blue Planet : An Introduction to Earth System Science』 ISBN: 9780471236436

All additional reference books are available at the Library of the School of Global Engineering, in Yoshida Campus, and also at other Kyoto University libraries. Previous editions of the same books can also be used.

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

Handouts will be provided at the beginning of each session. You are expected to use them to follow the lectures, to take notes, and as a starting point to further your personal self-learning.

At the end of each one of the five topics in which this class is divided, you will be given one week to submit a report answering four to five questions specific to the topic. Answering them will require doing some additional research on the recommended bibliography or other resources. Full references will be expected.

[Others (office hour, etc.)]

Office hours will be provided during the first lecture.
**Course title**
Introduction to General Astronomy-E2

**Affiliated department, Job title, Name**
Graduate School of Science, Senior Lecturer, LEE, Shiu Hang

**Group**
Natural Sciences

**Field(Classification)**
Earth Science(Foundations)

**Language**
English

**Old group**
Group B

**Number of credits**
2

**Number of weekly time blocks**
1

**Class style**
Lecture

**Course offered year/period**
2018 • First semester

**Day/period**
Wed.4

**Target year**
All students

**Eligible students**
For all majors

### [Outline and Purpose of the Course]

The quest to understand our origins, the origins of the universe is probably one of the oldest of human kind. In this course the latest advances in our knowledge of the universe are learned in plain language. The spatial and temporal scales of the universe and the key components (planets, stars, and galaxies, and their structures) are described in detail, and the basic techniques and logic employed in astronomical science are discussed.

### [Course Goals]

To obtain an overview understanding of the universe currently obtained by humankind, and to learn the basics of astronomical observations and theories employed in discoveries about the cosmos. Through the above, students will cultivate in themselves an scientific attitude which can be applied in their daily life and future career.

### [Course Schedule and Contents]

The following topics will be introduced (but not necessarily in this order):
1. Overview of modern astronomy and astrophysics
2. Planets, moons and other objects in the Solar System
3. Formation of planetary systems
4. Observation of exo-planets
5. Our Sun
6. Stars
7. Supernova explosions
8. Neutron stars and pulsars
9. Blackholes and general relativity
10. Active galaxies
11. Gamma-ray bursts

Each item above will be covered in 1 to 1.5 lectures, except stellar evolution which will be covered in 2 lectures.

### [Class requirement]

None

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Introduction to General Astronomy-E2(2)

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

Evaluation based on:
1) Weekly online homework (due every Tuesday), and
2) Class attendance (taken after registration period)

**[Textbook]**

Instructed during class

**[Reference book, etc.]**


**[Related URL]**

https://sites.google.com/view/kus-astro101e (Lecture notes, homework and announcements can be found here)

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

Read the lecture notes, online materials and reference book

**[Others (office hour, etc.)]**

Students are encouraged to ask questions during the lectures, and are welcome to contact the professor by email outside of class hours.
The Earth was born as a "fireball" of mixed molten rock and metal; after subsequent hardening, it was very similar with the other "inner" planets: Mars, Venus and Mercury. However, Life was formed only on planet Earth. Why Earth followed a different destiny from other planets? During this lecture we will follow the history of Earth's evolution, from its formation until present days. To facilitate understanding and encourage active participation during the class, some materials and vocabulary in Japanese will be also provided.

[Course Goals]
The student will familiarize with the most important events in the Earth history and will be able to understand the formation and structure of planet Earth.

[Course Schedule and Contents]
- Formation of the Solar System and the Earth;
- Structure of the Earth;
- Beginning of Plate Tectonics;
- Birth and evolution of Life;
- Atmosphere evolution: oxygen and carbon dioxide;
- The supercontinent cycle;
- Continent fragmentation and magmatic activity;
- Macro-evolution of Life and extinction episodes.

For each of the topics above, we plan 1-2 classes.

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on class attendance and active participation (30%), class-room exercises (30%) and a final examination (40%).

[Textbook]

[Reference book, etc.]

[Regarding studies out of class (preparation and review)]
Students will be expected to do readings in preparation for the class. Class-related materials should be downloaded and printed out by students, from a dedicated website, which will be announced at the beginning of the lecture.

[Others (office hour, etc.)]
Students can meet me during office hours with prior appointment. The number of students who can take this class will be limited to a maximum of 60 students.
Course title: Science on Water, Soil and Ecosystems-E2

Affiliated department, Job title, Name: Graduate School of Agriculture, assistant Professor, VILAYVONG, Khonesavanh

Group: Natural Sciences
Field(Classification): Earth Science(Foundations)

Language: English
Old group: Group B

Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • Second semester

Day/period: Thu. 2
Target year: Mainly 1st & 2nd year student
Eligible students: For all majors

[Outline and Purpose of the Course]
Similar to acquiring basic sciences of physics, chemistry, and biology, this course introduces students to basic sciences, concepts, and applications of three primary earth system components: water, soil and ecosystems. Knowledge of basic sciences of these components is vital for scientific observation and understanding environmental problems and solutions. The outcome of this course could serve the interest students as a bridge to pursue more complex issues on environmental science due to interrelated or interdisciplinary nature of the course.

[Course Goals]
1. To introduce students basic science, concepts and applications of soil, water, and ecosystems for solving environmental issues.
2. To develop academic, technical and communication skills of the interested students on topics of water, soil, and ecosystems.

[Course Schedule and Contents]
1. Issues of environment and sustainability
2. Water resource and supply
3. Water properties and behavior
4. Water pollution, sources and characteristics
5. Water treatment processes:
   - Coagulation
   - Flocculation
   - Sedimentation
   - Filtration
   - Disinfection
6. Wastewater and treatment processes
7. Nature and properties of soils (soil physics)
8. Nature and properties of soils (soil chemistry)
10. Soil contamination and remediation
11. Waste disposal and management
12. Air pollution and control
13. Ecosystems and ecosystem services
14. Environmental assessment
15. Examination
16. Feedback

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Students' evaluation are conducted on the performance basis on
(1) applying knowledge through answering mini-quizzes (15%);
(2) developing scientific communication skills through writing summary reports of book chapters, research papers and oral presentation (25%);
(3) writing a short essay of a case study using critical & problem-solving skills (10%) (final examination (50%)

[Textbook]
Instructed during class
Reading materials and handouts will be distributed.

[Reference book, etc.]
Daniel D. Chiras "Environmental Science (10th Ed)" (Jones and Bartlett Learning) ISBN:978-1-284-05735-5 (Not all chapters are covered in the course (available in library))
Additional reading materials will occasionally be introduced in some lectures.

[Regarding studies out of class (preparation and review)]
Students are expected to be independent in finding online resources to attain relevant issues and to enhance student knowledge and understanding on the subject.

[Others (office hour, etc.)]
Prior arrangement is highly necessary, preferably email notice is recommended before any consultation on the subject.
Introduction to Earth Science B-E2

The Earth System is divided into four subsystems: atmosphere, hydrosphere, geosphere and biosphere. This lecture focuses on the first three subsystems and introduces their interactions in the different time scales. In particular, this lecture will be outlined interaction and material circulation between these three subsystems, and transition and change in the global environment over the 4.6 billion year history of the Earth.

Course Goals

The objective of this course is to develop an understanding of fundamental geological concepts and processes of plate tectonics and its influences on the dynamic Earth. The lectures comprise a general introduction to plate tectonics theory and selected detailed field case studies from Japan and the world.

At the end of the semester, students should be able to understand fundamental geological concepts and processes, within an Earth System context, and how the application of physical, chemical and biological sciences can be applied to solve geological problems.

Course Schedule and Contents

The Earth System is broadly divided into four subsystems: atmosphere, hydrosphere, geosphere and biosphere. There is exchange of both matter and energy within those subsystems, in different time scales.

The main contents of this lecture are:

1. Interactions and material circulation among these three subsystems of the Earth System
2. Consist of the global environment
   • Formation of the Earth
   • Environment of the early Earth
3. The climate change in Earth's history
   • Ice Age vs. No Ice Age
   • Glacial/Interglacial periods fluctuations
   • Climate change after the last glacial period

The contents of each topic will be delivered in three lectures.

Class requirement
None

Method, Point of view, and Attainment levels of Evaluation

Students are able to (1) demonstrate understanding of basic geological processes and relationships at global to local scale including how this knowledge can be applied to issues of relevance to Japan; 2) identify and interpret common geological features and processes within the Earth System context and (3) demonstrate an understanding of the complex Earth System and its processes at a regional and global scale now, in the past, and in the future. The evaluation method comprises (1) an in class assignment (40%) and (2) written examination during the official examination term (60%).

Textbook
Not fixed

Reference book, etc.
(Reference book)
Introduced during class

Regarding studies out of class (preparation and review)

This course has been designed to allow students to integrate the concepts covered in lectures with own readings. A joint group project is developed by students based on data from a range of sources. Students will be supported throughout the project by discussions with your lecturer and associated students.

Others (office hour, etc.)
to be confirmed
**Course title**
Introduction to Hydrology-E2

**Group**
Natural Sciences

**Field (Classification)**
Earth Science (Development)

**Language**
English

**Old group**
Group B

**Number of credits**
2

**Number of weekly time blocks**
1

**Course style**
Lecture

**Course offered year/period**
2018 • First semester

**Day/period**
Tue. 4

**Target year**
Nearly 1st & 2nd year students

**Eligible students**
For science students

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**Outline and Purpose of the Course**
The aim of this course is to build basic understandings to study utilization of natural resources and natural disasters in the earth. This lecture explains water availability in the earth, basic hydrological phenomena to create water circulation and water budget. Based on this basic knowledge, all students will study current technical issues to be solved, and create basis for mutual international understandings by comparing Japan and foreign countries case studies.

**Course Goals**
The goals are to develop an understanding of how hydrology and hydrological applications can be used to secure water for people, based on a sound scientific understanding of hydrologic and hydraulic processes. This includes protection from excess water and from water shortage, as well as providing sufficient water for a sustainable environment.

Course Outcomes:
- be aware of water resources issues in national and global scale,
- be able to qualitatively and quantitatively describe the main processes in the hydrologic cycle, and surface and ground water hydrology
- be able to provide solutions for typical water resources problems found in practice;

PRACTICAL SKILLS: On completion of this course students should be able to:
- Calculate the water budget of a watershed;
- Calculate average precipitation stream flow and stage discharge relationship;
- Calculate infiltration employing several models;
- Estimate evaporation rates and evapotranspiration;
- Define the relationship between rainfall and hydrograph analysis;
- Measure the flow discharge and velocity in the stream

**Course Schedule and Contents**

<table>
<thead>
<tr>
<th>Week</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction: Hydrological Cycle and Processes</td>
</tr>
<tr>
<td>2</td>
<td>Precipitations Forms, Types, and Rainfall Measurements</td>
</tr>
<tr>
<td>3</td>
<td>Hydrologic Abstractions</td>
</tr>
<tr>
<td>4</td>
<td>Areal Precipitation Forms, Types, and Rainfall Measurements</td>
</tr>
<tr>
<td>5</td>
<td>Infiltration: Process, Measurement, and Estimation</td>
</tr>
<tr>
<td>6</td>
<td>Evaporation: Process, Measurement, and Estimation</td>
</tr>
<tr>
<td>7</td>
<td>Hydrology of Japan and water resources sustainability</td>
</tr>
</tbody>
</table>

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**Introduction to Hydrology-E2(2)**

- Week 8: Runoff and Hydrographs
- Week 9: Groundwater Hydrology
- Week 10: Groundwater Hydrology
- Week 11: Stream Flow Measurements
- Week 12-13: Flooding
- Week 14: Monitoring Techniques
- Week 15: Final Report
- Week 16: Feedback

**Class requirement**
None

**Method, Point of view, and Attainment levels of Evaluation**
Student will be assessed in the course based on quiz during regular lectures, reports, in class assessment and active participation (40%) and a final report (60%)

**Textbook**

**Regarding studies out of class (preparation and review)**
Students are requested to read carefully listed textbook and access to case studies on each hydrological process through website and related literatures.

**Others (office hour, etc.)**
Class participation and questions are very welcome during the lectures or at the end of the lecture. The schedule of office hours will be announced later. Moreover, if you have extra question, students may contact me by email.

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**Lecture code:** N559001
**Introduction to Engineering Geology**

Geology comes from the Greek geo, "Earth", and logos, "discourse". This class provides a basic knowledge of our planet's components (matter, minerals, rocks, etc.) and their main processes (mineral formation, plate tectonics, volcanic activity, earthquakes, etc.) from the viewpoint of engineering.

The correct understanding of the Earth and its many interacting parts, in different physical and time scales, using the basic knowledge and principles of geology, will help us confirm that all important geological factors are adequately considered when designing, constructing, and operating engineering works.

**Course Goals**

By the end of the semester, you should be able to not only understand and have a basic knowledge of geology, but also to think about its application when designing, constructing, and operating engineering works, when using natural Earth resources, and when trying to solve geoenvironmental problems.

**Course Schedule and Contents**

The main contents of this lecture are:

1. Introduction to Engineering Geology
2. Earth Matter
3. Geologic Time
4. Plate Tectonics and Mass Wasting
5. Water and the Geosphere
6. Earth Resources

The contents of each topic will be delivered in two or three lectures each.

**Class requirement**

None

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

Grading will be based on weekly quizzes (30%, lowest score is eliminated), a midterm report (30%), and a final exam (40%)

**Textbook**

Not used

**[Reference book, etc.]**


Edward A. Keller 『Introduction to Environmental Geology』 ISBN: 9780132251501


Brian J. Skinner, Barbara Murck 『The Blue Planet : An Introduction to Earth System Science』 ISBN: 9780471236436


All reference books are available at the Library of the School of Global Engineering, at the Main Yoshida Campus Library, and/or at other Kyoto University libraries. Previous editions of the same books can also be used.

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

During the Guidance (first class of the semester), you will be provided with a list of research topics, minimum questions to answer, and a list of initial resources to find the corresponding information, for all the scheduled sessions of the semester. You are expected to research these topics ON YOUR OWN and come prepared to the corresponding class.

At the beginning of every class, individual and group quizzes will be given to test the self-acquired knowledge.

**[Others (office hour, etc.)]**

Office hours will be provided during the first lecture.
<table>
<thead>
<tr>
<th><strong>Course title</strong></th>
<th>Introduction to Mineral Resources-E2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Affiliated department, Job title, Name</strong></td>
<td>Graduate School of Energy Science Associate Professor, MCLELLAN, Benjamin</td>
</tr>
<tr>
<td><strong>Group</strong></td>
<td>Natural Sciences</td>
</tr>
<tr>
<td><strong>Field(Classification)</strong></td>
<td>Earth Science(Development)</td>
</tr>
<tr>
<td><strong>Language</strong></td>
<td>English</td>
</tr>
<tr>
<td><strong>Old group</strong></td>
<td>Group B</td>
</tr>
<tr>
<td><strong>Number of credits</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Number of weekly time blocks</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Class style</strong></td>
<td>Lecture</td>
</tr>
<tr>
<td><strong>Course offered year/period</strong></td>
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</tr>
<tr>
<td><strong>Day/period</strong></td>
<td>Thu.2</td>
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<td><strong>Target year</strong></td>
<td>Mainly 1st &amp; 2nd year students</td>
</tr>
<tr>
<td><strong>Eligible students</strong></td>
<td>For science students</td>
</tr>
</tbody>
</table>

**Course Schedule and Contents**

- Week 1 - 4 (Basics of Geology and Earth Sciences with a focus on mineral resources)
  1. Introduction to earth sciences and the importance for minerals resources
  2. Geology and the lithosphere - geological time and formations
  3. Processes of rock and mineral formation
  4. Mineralogy

- Week 5-14 (Minerals resources and their extraction, transformation into mineral products)
  5. Reserves, resources, geological uncertainty and economics
  6. Mineral deposits and mining
  7. Beneficiation of ore and minerals processing - general considerations
  8. Manufacturing mineral products - general considerations
  9. Case study 1 - Precious metals
  10. Case study 2 - Rare earths
  11. Case study 3 - Aluminium
  12. Waste, recycling and environmental impacts
  13. Social impacts of minerals - Dutch disease and conflict
  14. Future mining - what comes next?

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

The course will be assessed based on participation (30%) and a final presentation (10%) and assignment (60%).

**[Textbook]**

W.J. Rankin, 2011『Minerals, metals and sustainability』（Textbook is not necessary, but is a very useful reference and will be referred to in class.）

**[Reference book, etc.]**

Graham R. Thompson, Jon Turk; 2009『Earth Science and the Environment (4th edition)』
Jeremy.P. Richards, 2009『Mining, society and a sustainable world』

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

Class materials will be loaded on PandA and pre-reading may be required. Final assessment is typically a report, which will require a number of hours for research and writing.

**[Others (office hour, etc.)]**

Environment

Technical Lifecycle

- Raw Materials Extraction
- Processing
- Smelting / Refining
- Manufacture
- Use
- Recycling & Waste Management

Society and Economy
# Outline and Purpose of the Course

Understanding the past earth activities and its geological records provides essential information to predict development and environmental change of the earth. Past earth activities can be investigated through geological field studies. This lecture is designed to understand the role of field work studies based on traditional to modern earth scientific methods.

# Course Goals

The objective of this course is to develop an understanding of fundamental geological concepts and processes of plate tectonics and its influences on the dynamic Earth. The lectures comprise a general introduction to plate tectonics theory and selected detailed field case studies from Japan and the world.

# Course Schedule and Contents

This lecture is designed to teach the essence of geological field surveys and studies. The main concept of the developing earth is based on the theory of plate tectonics. This lecture demonstrates how geological information obtained by field studies enables earth scientists to establish the plate tectonics theory.

1. General introduction of the significance of the field survey correlated with the plate tectonics theory (2 times)
2. Understanding time scale which produce various geological phenomenon (2 times)
3. Introduction of development the geology around Kyoto, accretional complex (2 times)
4. Case studies (8 times)
   - Antarctica
   - North polar-region
   - Himalaya
   - Volcanic chains in the circum Pacific region

# Class requirements

None

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

Students are able to (1) demonstrate knowledge of geological techniques relevant to the plate tectonics theory, and (2) identify and interpret common minerals, rocks, fossils and tectonic structures and interpret their formation; and (3) read and interpret basic geological maps. The evaluation method comprises (1) an in class assignment (40%) and (2) written examination during the official examination term (60%).

# Textbook

Not fixed

# Regarding studies out of class (preparation and review)

This course has been designed to allow students to integrate the concepts covered in lectures with own readings. A joint group project is developed by students based on data from a range of sources. Students will continue to Field Earth Science-E2(2) to be supported throughout the project by discussions with your lecturer and associated students.

# Others (office hour, etc.)

To be confirmed
### Advanced Practice of Earth Science-E2(2)

Due to ongoing safety issues caused by earthquakes / volcanic eruptions in Kyushu, alternative fieldwork areas are explored if required. Depending on the situation, the excursion plan might be changed.

A series of “observations and exercises” will be conducted for individual groups consisting of several attendees. Each attendee is requested to do the observations and exercises during field work and to analyze the obtained data, together with other students. Additional observations and exercises will be planned and conducted where necessary. The course is designed so that each attendee can experience and participate in geological scientific research.

#### [Course Goals]

PLEASE NOTE: Due to ongoing safety issues caused by earthquakes / volcanic eruptions in Kyushu, alternative fieldwork areas are explored if required. Depending on the situation, the excursion plan might be changed.

Collection and interpretation of geological data in the field are fundamental skills for a professional earth scientist. This course develops and extends field skills through a 5-day field trip to Kyushu March 03-07, 2019. The field trip challenges students to collect high quality field data with which to interpret the geological processes over a wide time range in the Beppu and Kuju area, central Kyushu.

At the end of the class, students should be able to understand fundamental geological concepts and processes, within an Earth System context, and how the application of physical, chemical and biological sciences can be applied to solve geological problems.

#### [Course Schedule and Contents]

PLEASE NOTE: Due to ongoing safety issues caused by earthquakes / volcanic eruptions in Kyushu, alternative fieldwork areas are explored if required. Depending on the situation, the excursion plan might be changed.

Preparation day the in 02/2019: 13:00-16:00: Introduction seminar at Kyoto University Yoshida campus (office 376) prior to the excursion to meet students and provide them with a brief background of the course.

Day 1: Sunday March 03, 2019: 09:00 meet at Beppu Geothermal Research Laboratory, 3088-176, Noguchi baru, Beppu, Oita, 874-0903, Japan. Excursion start: Beppu Graben: visit active fault scar, geothermal plant and sources of hot springs.

Day 2: Monday March 04, 2019: Also: visit caldera and erupting volcano, Harajiri waterfall and outcrops of the youngest pyroclastic flow deposits (Aso-4) (Japan Geoparks).

Day 3: Tuesday March 05, 2019: Travel Beppu to Himeshima Island and return: visit ancient volcano, green obsidian, pyroclastic surge deposits, magmatic soda springs and metamorphic rock xenoliths.

Day 4: Wednesday March 06, 2019: Radon measurements along the Horita Fault, Beppu.

Day 5: Thursday March 07, 2019: Reporting and presentation day at Beppu Geothermal centre, summary seminar. Afternoon travel Beppu-Kyoto.

#### [Class requirement]

Open to all students with science background (2 year) and international students. If more than 10 students apply a lottery will conducted to select participants. All travelling cost from Kyoto to Beppu and return should be paid by attendees. Accommodation in Beppu at the Beppu Geothermal Research Laboratory will be organised by Kyoto University teachers at an estimated cost of ca. 3000 Yen for 5 nights. All attendees have to join the necessary insurance; e.g., Personal Accident Insurance for Students Pursuing Education and Research (Gakkensai) [學生教育研究災害傷害保険（学研災）]

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

Students are able to (1) collect field data and integrate with regional datasets to interpret a complex geological area; (2) critically appraise existing reports with new field data; (3) interpret regional datasets; and (4) present results in a written report and a presentation. The evaluation method comprises (1) a written report (60%) and (2) presentation (40%).

※なお，単位認定は翌年度となる可能性がある。進級・卒業判定がかかる学生はこのことに注意すること。

#### [Textbook]

Instructed during class

#### [Reference book, etc.]

残忍 during class

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

This course has been designed to allow students to integrate the concepts covered in lectures with own readings. A joint group project is developed by students based on data from a range of sources. Students will be supported throughout the project by discussions with your lecturer and associated students.

#### [Others (office hour, etc.)]

In February 2019 (day the in 01/2019 after student list is confirmed) a half day seminar at Kyoto Uni Yoshida campus (office 376) is scheduled prior to the excursion to meet students and provide an introduction of the fieldcourse.
Course title: Basic Data Analysis-E2
Affiliated department, Job title, Name: Institute for Frontier Life and Medical Sciences Program-Specific Senior Lecturer, VANDENBON, Alexis

Group: Natural Sciences
Field(Classification): Data Science(Foundations)
Language: English
Old group: Group B
Number of credits: 2
Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • First semester

Day/period: Tue.2
Target year: All students
Eligible students: For all majors

[Outline and Purpose of the Course]

Nowadays, research in many fields of science is becoming increasingly driven by large amounts of data. This course will focus on biological data, and address the key problem of how to turn this data into new knowledge. The course will start with a brief review of probability theory. After that, we will introduce regression and classification methods, including support vector machines and neural networks.

[Course Goals]

Students will learn about basic concepts in data analysis and statistical learning, such as regression and classification problems, and supervised and unsupervised machine learning. Students will become familiar with strengths and weaknesses of several approaches, and learn how to apply them on real datasets.

[Course Schedule and Contents]

In principle, the course will be offered according to the following plan. However, depending on the progress of the course, the order or the number of lectures for each topic may change.

1. Introduction to data analysis: We will discuss data analysis in the context of scientific investigation. Using several examples, the concepts of supervised and unsupervised learning, and regression and classification problems will be introduced.
2. Introduction on probability theory: We will briefly review probability, probability distributions, the normal distribution, mean and variance, and other key terms that will be used in the following lectures.
3. Regression methods: Introduction to linear regression as a simple supervised learning approach. We will cover line fitting, residuals, correlation, and least squares regression. We also expand this to multiple regression.
4. Classification methods (1): We will introduce classification methods, and discuss differences with the regression approach from the previous lecture. We will introduce logistic regression and k-nearest neighbors, and other models introduced so far.
5. Model assessment: Model accuracy and complexity will be more formally discussed in the context of the “No Free Lunch Theorem”. We will also introduce cross-validation and the bootstrap and their use for model selection.
6. Tree-based methods: Focussing on decision trees, we will introduce tree-based methods for regression and classification. Some of their properties and extensions will be discussed.
7. Linear classifiers and Support Vector Machines (SVMs): We will discuss simple linear classifiers, and use them as a base to introduce SVMs as an example of a more complex, popular classification method.
8. Neural Networks: We will describe neural networks, their underlying principles and how to train them on sample data. Their properties will be discussed through application on example data.
9. Clustering (1): We will introduce approaches for grouping data into sets of similar samples. The use of k-means clustering will be discussed by application on gene expression data.
10. Clustering (2): We will introduce a second clustering method: hierarchical clustering. We will apply this method on the same data as used in the previous lecture, and discuss differences with the k-means clustering approach.
11. Principal Component Analysis (PCA): We will introduce approaches for dimension reduction and exploratory analysis of high-dimensional data, focussing on PCA. We will discuss what can be and cannot be done by PCA by application on gene expression data.
12. Batch effects: In this lecture we will discuss exploratory data analysis and batch effects. Batch effects are widespread in experimental data, and can strongly affect downstream analysis. We will introduce ways of finding such biases and how to treat them.
13. Final examination.
14. Review of course material.
15. Final examination.
16. Feedback

[Class requirement]

The course is intended for students who have had at least an elementary course in statistics. Programming experience is useful but not required.

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

Grading: attendance and active participation (20%), mid-term exam (20%), quizzes/assignment (20%), and final exam (40%)

[Textbook]

James, Witten, Hastie and Tibshirani  
An Introduction to Statistical Learning: with Applications in R (Springer) ISBN:978-1461471370  
(The course lectures will follow the content of this textbook. Sections of the book to read in preparation of each class will be announced. This textbook contains theoretical parts as well as practical exercises. Please note that this textbook is also freely (legally) available for download at http://www-bcf.usc.edu/~gareth/ISL/)

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

The course will follow a textbook. At the end of each lecture I will specify the sections to read before the next lecture.

[Others (office hour, etc.)]

No fixed office hours. Students are requested to make appointments directly or by email.
Course title: Introductory Statistics-E2

Affiliated department, Job title, Name: Graduate School of Medicine, Assistant Professor, VEALE, Richard Edmund

Group: Natural Sciences
Field (Classification): Data Science (Foundations)

Language: English
Old group: Group B
Number of credits: 2

Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • First semester

Day/period: Thu.3
Target year: All students
Eligible students: For all majors

[Outline and Purpose of the Course]
Statistical methods are used throughout science, but there is often a wide gap between basic statistics courses and how statistical methods are applied in the scientific literature. This course intends to narrow this gap by introducing students to basic statistical concepts and by providing insight into how these concepts are used in the “real” scientific world. This will entail descriptive statistics, inferential statistics, and data visualization. Real-world examples will be drawn from the behavioral and life sciences, medicine, and epidemiology. The language of instruction in this course is English which will help to understand the statistical terminology in the scientific literature.

[Course Goals]
- To acquire basic statistical knowledge and the ability to conduct basic statistical analysis.
- To be able to critically read scientific reports and to judge their quality in terms of statistical methodology.

[Course Schedule and Contents]
1) Introduction
2) Data collection: Survey sampling
3) Data collection: Experiments and clinical trials
4) Data editing and summary
5) 2 by 2 tables: Chi-square tests
6) Tests for independence: Fisher's exact tests
7) Risk ratios and odds ratios
8) Tests of difference of two proportions
9) Random sampling, randomization, and sample size calculations
10) Probability distributions and limit theorems
11) Tests of two means
12) Correlations and regressions
13) How to use statistics correctly?
14) Further studies
15) Feedback

[Class requirement]
None

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Introductory Statistics-E2(2)

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on class attendance and active participation (30 points), and written reports as homework (70 points). The reports are to test whether the students have achieved the course goals. Students who are absent more than four times will not be credited.

[Textbook]
Not used
Lecture notes will be provided during the course.

[Reference book, etc.]

[Regarding studies out of class (preparation and review)]
To achieve the course goals, students should review the lecture material and practice with homework provided in class. This class uses the statistical software JMP which is available to Kyoto University students. The time necessary for review should be in the range of 3 hours per class.

[Other (office hour, etc.)]
No fixed office hours, but students are welcome to arrange appointments by email.

Lecture code: N804001
Course title: Introductory Statistics-E2

Affiliated department, Job title, Name: Institute for Frontier Life and Medical Sciences Program-Specific Senior Lecturer, VANDENBON, Alexis

Group: Natural Sciences
Field(Classification): Data Science(Foundations)

Language: English
Old group: Group B
Number of credits: 2

Number of weekly time blocks: 1

Class style: Lecture
Course offered year/period: 2018 · Second semester

Day/period: Tue.2
Target year: All students
Eligible students: For all majors

[Outline and Purpose of the Course]
Statistics is arguably the most important science in the world, because every other field of science depends upon it. Nowadays, science is becoming increasingly driven by large amounts of data. The key problem is how to extract knowledge from this data. Statistical analysis is a necessary step in solving this problem. This course will introduce the theory behind basic statistics and practical applications.

[Course Goals]
Students will learn about basic concepts in statistics, and learn to apply them on real datasets. Students will develop a feeling for critical thinking when faced with data, be able to make hypotheses, and suggest relevant ways to test them.

[Course Schedule and Contents]
In principle, the course will be offered according to the following plan. However, depending on the progress of the course the order or the number of lectures for each topic may change.
1. Introduction to statistics and data analysis (part 1). Statistics in the context of the general process of investigation, including a brief introduction to data collection, sampling, and experimental design.
2. Introduction to statistics and data analysis (part 2). Introduction to numerical and categorical data. Simple ways of visual inspection (scatter plots, histograms, etc) and summary statistics.
3. Probability (part 1). Formal introduction to probability, probability distributions, independent and dependent variables, and conditional, marginal, and joint probability.
4. Probability (part 2). Introduction to random variables. How to calculate the expected value and variability of a random variable?
5. Distributions of random variables. Introduction to the normal distribution and its properties. Other common probability distributions will also be discussed, including the geometric and binomial distributions.
6. Foundations for inference (part 1). We will discuss the principles of parameter inference, and the reliability of parameter estimates, including standard errors and confidence intervals. We will also introduce hypothesis testing and p-values based on these principles.
8. Inference for numerical data (part 1). Practical applications of parameter inference on numerical data. The t-test and illustrations of its use for hypothesis testing.
10. Inference for categorical data (part 1). In this lesson, we introduce parameter inference for categorical (non-numerical) variables. For example, we examine proportions, their confidence intervals, hypothesis testing, and comparison.
11. Inference for categorical data (part 2). Discussion of the widely used Chi-square test for goodness of fit, and randomization tests.

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Grading: attendance and active participation (20%), mid-term exam (20%), quizzes/assignment (20%), and final exam (40%)

[Textbook]

[Regarding studies out of class (preparation and review)]
The course will follow a textbook. At the end of each lecture I will specify the sections to read before the next lecture.

[Others (office hour, etc.)]
No fixed office hours. Students are requested to make appointments directly or by email.
Course title: Data Analysis Practice I-E2

Affiliated department, Job title, Name: Graduate School of Pharmaceutical Sciences, Senior Lecturer, RAKERS, Christin

Group: Natural Sciences
Field(Classification): Data Science(Development)

Language: English
Old group: Group B
Number of weekly time blocks: 1
Class style: Seminar
Course offered year/period: 2018 • First semester

Day/period: Thu.4
Target year: All students
Eligible students: For all majors

[Outline and Purpose of the Course]
Social media and web apps regularly infilrate our daily lives and we are confront with a constant flow of information. How can we use the data to our advantage and discover patterns or extract useful information? This course is aimed at students from all disciplines who want to learn essential data analytics skills. Prior specialized knowledge is not required to attend and topics will be introduced at a beginner’s level. The course imparts methods to obtain, clean, analyze, and visualize data from the web and communicates basic concepts in data mining and statistical analyses. This course will focus on general societal applications (e.g. social media data). The lectures will be complemented by live demonstrations of computational workflows and visualization techniques.

[Course Goals]
In this course, students will
- learn about the theoretical basis of the internet, web data, and data mining methods
- gain the skills to retrieve, analyze, explore, and visualize data and draw conclusions for decision making
- become familiar with computational operations, software, and data structures
- acquire the ability to develop and apply analytical workflows to web data of their interest

[Course Schedule and Contents]
The order and depths of topics may be subject to change depending on the students’ feedback, learning progress, and levels of proficiency

1 - 2] Introduction to Internet architecture, web-based data, and data mining
3 - 4] Introduction to Jupyter/R
5 - 6] Public data including SNS platforms, methods for data retrieval and cleaning
7 - 8] Basic data visualization and exploration concepts
9 - 11] General data mining techniques and applications
12 - 14] Web mining methods and applications
15] Final written exam
16] Feedback

[Class requirement]
Access to a personal computer is required in order to complete homework assignments.

Data Analysis Practice I-E2(2)

[Method, Point of view, and Attainment levels of Evaluation]
20% Class attendance/ participation
50% Homework assignments
30% Final written examination

[Textbook]
The following books provide deeper insights into presented topics, but are no mandatory prerequisites to successfully complete the course.

[Reference book, etc.]
(Reference book) Introduced during class
(Related URL) (Announced during class.)

[Regarding studies out of class (preparation and review)]
Weekly review of course content is advised. Handouts will be provided by the instructor. The completion of homework assignments in groups of 1 to 3 students and the preparation for the final written exam require additional time investment outside of class.

[Others (office hour, etc.)]
Announced during class.
This course aims to summarize data science concepts and methods in a manner that emphasizes the acquisition, analysis and interpretation of data and datasets. Probability and distributions will be explored conceptually using graphical and numerical approaches. Concepts from classical hypothesis testing and machine learning will be emphasized through example. No prior knowledge of statistics or data science is required. Computer programming experience is an asset.

Course Goals

Students will learn the basics of data science, statistics and computer programming. Students will understand when certain data science tools are useful and when they are inappropriate.

Course Schedule and Contents

Over this 15-week lecture the following topics will be covered in each class:

1) What is Data Science?
2) Python I: Basics
3) Python II: Data visualization
4) Describing Data I: Central Tendency and Dispersion
5) Describing Data II: Correlation
6) Probability I: Random Variables
7) Probability II: Hypothesis testing
8) Probability III: Simulating experiments
9) Working with Real Data I: Getting Data
10) Working with Real Data II: Exploring Data
11) Machine Learning I: Introduction
12) Machine Learning II: k-Nearest Neighbors
13) Machine Learning III: Decision Trees
14) Machine Learning IV: Neural Networks
15) Final example: Natural Language Processing

Data Analysis Practice II-E2(2)

Method, Point of view, and Attainment levels of Evaluation

Students are expected to produce all in-class demonstrations independently, and to independently complete weekly assignments. Evaluation will be based on the following criteria: attendance and participation (10%), assignments (90%: 15 assignments @ 6% each).

Textbook

Not used

Reference book, etc.

Joel Grus 『Data Science from Scratch: First Principles with Python』 (O'Reilly Media) ISBN:978-1491901427 (Lectures will loosely follow this textbook's content. This textbook is OPTIONAL, but will be useful for reviewing concepts and for independent study.)

Related URL

https://github.com/joelgrus/data-science-from-scratch (Software (data and Code) for “Data Science from Scratch” by Joel Grus)

Regarding studies out of class (preparation and review)

There will be a small software-based assignment each week based on lecture content; students should submit these assignments more than one day before the next lecture.

Others (office hour, etc.)
<table>
<thead>
<tr>
<th>Course title</th>
<th>Data Analysis Practice I-E2</th>
</tr>
</thead>
</table>

**Affiliated department, Job title, Name**
Graduate School of Pharmaceutical Sciences, Senior Lecturer, RAKERS, Christin

<table>
<thead>
<tr>
<th>Group</th>
<th>Natural Sciences</th>
</tr>
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<tr>
<td>Field(Classification)</td>
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<td>Language</td>
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<td>Group B</td>
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<td>Number of weekly time blocks</td>
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<td>Class style</td>
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<td>Course offered year/period</td>
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<tr>
<td>Day/period</td>
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<td>Target year</td>
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</tr>
<tr>
<td>Eligible students</td>
<td>For all majors</td>
</tr>
</tbody>
</table>

| Number of credits | 2 |

### [Outline and Purpose of the Course]

Today’s research landscape is characterized by an increasing amount of publicly accessible scientific data, e.g. from chemical or genomic screenings. This course is aimed at students from all disciplines who want to learn essential data analytics skills that help to interpret and explore scientific data. Prior specialized knowledge is not required to attend the course and topics will be introduced at a beginner’s level. The lectures impart methods to obtain, clean, analyze, and visualize data from the web and illustrate basic concepts in data mining and statistical analyses. The lectures will be complemented by live demonstrations of computational workflows and visualization techniques.

### [Course Goals]

In this course, students will:
- learn about the theoretical basis of the internet, scientific web data, and data mining methods
- gain the skills to retrieve, analyze, explore, and visualize data and draw conclusions for decision making
- become familiar with computational operations, software, and data structures
- acquire the ability to develop and apply analytical, computer-based workflows for scientific data analysis of (future) research projects

### [Course Schedule and Contents]
(The order and depths of topics may be subject to change depending on the students’ feedback, learning progress, and levels of proficiency)

1 - 2: Introduction to Internet architecture, web-based data, and data mining
3 - 4: Introduction to Jupyter/R
5 - 6: Scientific databases, methods for data retrieval and cleaning
7 - 8: Basic data visualization and exploration concepts
9 - 10: Fundamental statistical processing
11 - 12: Classification, Regression
13 - 14: Clustering, Networks
15: Final written exam
16: Feedback

### [Class requirement]

Access to a personal computer is essential to complete homework assignments.

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**Data Analysis Practice I-E2(2)**

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

| 20 % Class attendance/ participation |
| 50 % Homework assignments |
| 30 % Final written examination |

### [Textbook]

The following books give deeper insights into presented topics, but are no mandatory prerequisites to successfully complete the course.

### [Reference book, etc.]

- Introduced during class

### [Related URL]

(Announced during class.)

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

Weekly review of course content is advised. Handouts will be provided by the instructor. The completion of homework assignments in groups of 1 to 3 students and the preparation for the final written exam require additional time investment outside of class.

### [Others (office hour, etc.)]

(Announced during class.)
Course title: Practice of Basic Informatics (2)

[Textbook]
The textbook "Practice of Basic Informatics" will be provided during the first week of classes. You are expected to read the corresponding chapters ahead of each class.

[Reference book, etc.]
- Brian Harn: "Fortran 90 for Scientists & Engineers" ISBN:0340600349

All additional reference books are available at the Library of the School of Global Engineering, in Yoshida Campus, and also at other Kyoto University libraries.

[Regarding studies out of class (preparation and review)]
You are expected to read the corresponding chapter ahead of each class. A brief explanation of the main topic will be delivered at the beginning of each session, but you are expected to come prepared ahead of time.

You will be given the rest of the class to practice the acquired knowledge by solving a proposed problem under the supervision of the instructor. You will have, however, a full week to submit your answers, so you can keep practicing after the session is over using other IIMC computers at Kyoto University.

[Others (office hour, etc.)]
This class requires the use of equipment administrated by the Institute for Information Management and Communication (IMIC), for which a valid account for the Educational Computers System of Kyoto University (ECS-ID) is required. Please, be sure to acquire your account ahead of time, and bring your username and password to the first session.

Office hours will be provided during the first day of classes.

Students who take this class are strongly recommended to take "Basic Informatics" and "Computer Programming in Global Engineering" the following semester.

Lecture code: T008001
### Course title
Information and Society-E2

### Affiliated department, Job title, Name
Graduate School of Informatics
Program-Specific Associate Professor, LIN, Donghui
Graduate School of Informatics
Program-Specific Associate Professor, JATOWT, Adam Wladyslaw

### Group
Informatics

### Field (Classification)
(Foundations)

### Language
English

### Number of weekly time blocks
1

### Class style
Lecture

### Course offered year/period
2018 • First semester

### Day/period
Wed. 5

### Target year
All students

### Eligible students
For all majors

### Eligible students
For all majors

### Number of credits
2

### Group B

### Course offered year/period
2018 • First semester

### Course Schedule and Contents

1. Introduction to information society: information, information society, Internet, relation of information, society and technology (about 2 weeks)

2. Intellectual rights and law: freedom of expression, right to know, right to be forgotten, information privacy as well as intellectual and industrial property rights such as patents and copyrights (about 2 weeks)

3. Information and economy: economic transactions, search/recommendation models for products, information asymmetry, network externality, lock-in phenomenon, path dependence, electronic payments, e-commerce, advertising on the Internet, impact of Internet on economy (about 3 weeks)

4. Information and education: information education, computer literacy, media literacy, information literacy, e-learning, MOOC, blended learning, digital divide, e-books (about 2 weeks)

5. Information archiving: digital content archiving, digital libraries, usage of archived contents, information validity over time (about 1 week)

6. Information design: information systems, search systems for information, information credibility, trust mechanisms (about 1 week)

7. Digital governance: digital democracy, digital community, social media, cloud computing, information policy (about 1 week)

### Class requirement
None

### Method, Point of view, and Attainment levels of Evaluation
Students are evaluated by the final exam.

### Textbook
Not used

Lecture slides will be printed and distributed during the lectures.

### Reference book, etc.
 Introduced during class

### Regarding studies out of class (preparation and review)
Students will review materials after classes based on the slide handouts.

### Others (office hour, etc.)
No office hours specified. E-mail: adam@dl.kuis.kyoto-u.ac.jp

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8. Social computing: human computation, crowdsourcing, collective intelligence (about 2 weeks)
Course title: Programming Practice(Matlab)-E2

Group: Informatics
Language: English
Number of weekly time blocks: 2
Day/period: Thu.4・5

[Outline and Purpose of the Course]
Matlab is a programming language widely used by academic and research institutions throughout the world. It has many libraries available and built-in tools for analyzing and visualizing multi-dimensional data. This course will introduce the students to computer programming using Matlab, with an emphasis on data analysis methods. The first half of the course will focus on familiarizing the students with the Matlab environment. In the second half of the course, the students will use Matlab to learn about basic data analysis techniques for multi-dimensional data.

[Course Goals]
The students will become proficient in the Matlab programming language, become familiar with basic statistical analysis, and be able to plot and visualize analysis results.

[Course Schedule and Contents]
Below is a list of topics we will cover during the course. There may be minor changes depending on the interests and abilities of the students. Each class is three hours long (等級別実験). Lessons will be given during the first half of class, and the second half of class will be for practice tutorials.

1) Introduction
2) Arrays and vectors
3) Plotting graphs
4) Control statements and built-in functions
5) Script files and functions
6) Debugging
7) Data structures
8) File I/O
9) Graphical user interfaces (GUI)
10) Matrices and 3D plots
11) Data fitting / regression
12) Basic statistics (computing correlations, t-test)
13) Binary classification (linear discriminant analysis)
14) Principal Component Analysis

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Class participation (10%), exercises (30%), final exam/project (60%)

[Textbook]
No textbook. Relevant materials will be distributed in class.

[Reference book, etc.]
Matlab tutorials are available online: http://www.mathworks.com/

There are also several textbooks available for self study, although they will not be required:
1) "Mastering MATLAB 7" by Duane Hanselman and Bruce Littlefield.
2) "MATLAB: An Introduction with Applications" by Amos Gilat.
   Publisher: Wiley (2008), ISBN: 978-0470108772
3) "MATLAB for Beginners: A Gentle Approach" by Peter Kattan.
   Publisher: CreateSpace Independent Publishing Platform (2008), ISBN: 978-1438203096

Students who wish to use Octave outside of class should see: http://www.octave.org/

[Regarding studies out of class (preparation and review)]
Students should review the course material after each class. All students will be given access to Matlab during class hours, but outside of class we recommend the freely available programming language Octave ( http://www.octave.org/ ) for practice outside of class.

[Others (office hour, etc.)]
### Course Goals
At the end of the course, students will be able to operate a computer to automatically:
1. search for specific entries in large data files
2. search for pattern-like entries in large data files
3. filter data files to desired content
4. perform basic summary and counting statistics on data
5. assemble small processing pipelines from the various tools they will study

### Course Schedule and Contents
1. Overview, problems and limitations of spreadsheets
2. Filesystem tree organization: understanding directory structure
   - Listing/copying/moving/deleting data
   - Introduction to the pipe mechanism
   - Standard input/output/error streams, delimiters
3. Sorting data
   - Trimming data by columns, front, or back
   - Counting data
   - Filename patterns/wildcards
   - Filtering data to unique entries or by patterns
4. More filtering of data by patterns
   - Stream editing
   - Basic loops for processing collections of data

### Class Requirement
No prior knowledge of computer programming or data processing is necessary.

### Method, Point of view, and Attainment levels of Evaluation
Class attendance (5%), Quizzes (40%), Report (25%), Final exam/project (30%)

### Textbook
Not used
Lecture notes and material will be provided in class.
Documentation about processing commands will be explained in class.
Students will have a chance to practice data processing during class.

### Reference book, etc.
Introduced during class

### Regarding studies out of class (preparation and review)
Students are strongly recommended to practice class material outside of class and deepen their understanding.

### Others (office hour, etc.)
Each student is recommended, but not required, to own a personal computer (laptop, desktop).
Windows / MacOS / Linux environments are acceptable.
### Introduction to Algorithms-E2

**Outline and Purpose of the Course**
This is an introductory non-technical course on algorithms designed for all undergraduate students, including liberal arts students. The goal of this course is to show how computers can solve practical problems, and especially to give the students a basic understanding of the notion of algorithms, their importance and how they work. All the notions will be motivated by real-life applications.

**Course Goals**
At the end of the course, students should understand the importance of algorithms and how they work.

**Course Schedule and Contents**
1. What are algorithms, and why should you care? (1 week)
2. How to describe and evaluate algorithms (1 week)
3. Sort and search algorithms: how do search engines work? (3 weeks)
4. Constructing algorithms: some simple but powerful techniques (3 weeks)
5. Graphs algorithms: how to represent practical problems on a computer, and solve them (4 weeks)
6. Easy vs. hard problems: what cannot be computed? (2 weeks)

**Class requirement**
This is a general non-technical course for all undergraduate students. No specific background from mathematics or computer science is required.

**Method, Point of view, and Attainment levels of Evaluation**
Evaluation on submitted reports (three reports during the semester).

**Textbook**
Not used

**Regarding studies out of class (preparation and review)**
The instructor expects students to spend enough time after each class for review. Additionally, mandatory reading material and assignments (3 reports) will be given during the course.

### Introduction to Coding Theory and Cryptography-E2

**Outline and Purpose of the Course**
Cryptography is the science studying, among other things, how to encode messages such that only the sender and the receiver can understand them. Such techniques have become indispensable, enabling for instance secure wireless networks, ATM or internet banking. Besides their cryptographic applications, codes are also widely used for the purpose of designing efficient and reliable data transmission. This includes data compression codes to efficiently transmit and store information as well error-correcting codes that permit automatic detection and correction of errors in the transmitted data. This course is a non-technical introduction to the field of coding theory and cryptography that will cover the history and importance of codes, the basics of modern cryptography and the design of codes for data compression and error correction.

**Course Goals**
At the end of the course, students should understand the basic concepts of coding theory and cryptography, and know how to use simple codes and cryptosystems.

**Course Schedule and Contents**
1. What are codes? Encryption, data compression and error correction (1 week)
2. History, importance and social impact of cryptography (2 weeks)
3. Modern encryption schemes: private-key and public-key cryptography (3 weeks)
4. Other applications of cryptography: digital signatures, secret sharing (1 week)
5. Information and coding: how to compress data (3 weeks)
6. Error correcting codes: mistakes that fix themselves (4 weeks)

**Class requirement**
This is a general non-technical course for all undergraduate students. No specific background from mathematics or computer science is required.

**Method, Point of view, and Attainment levels of Evaluation**
Evaluation on submitted reports (three reports during the semester).

**Textbook**
Not used

**Regarding studies out of class (preparation and review)**
The instructor expects students to spend enough time after each class for review. Additionally, mandatory reading material and assignments (3 reports) will be given during the course.

**Others (office hour, etc.)**
Basic Informatics(2)

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Quizzes and exercises (40%), final examination (60%)

[Textbook]
Instructed during class
Handouts distributed in class or uploaded to PandA

[Reference book, etc.]
Introduced during class

[Regarding studies out of class (preparation and review)]
Students are expected to spend about 1 hour on review. More than half of that time is spent preparing for class and doing assignments.

[Others (office hour, etc.)]
Any inquiry to the instructor: chang.kaichun.4z{at}kyoto-u.ac.jp (replace {at} with @)

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[Outline and Purpose of the Course]
This course discusses basic knowledge of information representation, computer hardware and software, Internet technical background, Internet services, algorithm in information processing, and related issues.

[Course Goals]
To understand basic knowledge of information representation, computer hardware and software, Internet technical background, Internet services, algorithm in information processing, and related issues.

[Course Schedule and Contents]

0. Introduction [1 week]

1. Representing information as bit patterns [3 weeks]
   1-1. The binary system
   1-2. Representing integers
   1-3. Representing fractions
   1-4. Representing text and other information

2. Computers and their peripherals [3 weeks]
   2-1. Computer architecture
   2-2. CPU and main memory
   2-3. Storage devices
   2-4. Input and output devices

3. Operating system and application software [2 weeks]
   3-1. Operating system architecture
   3-2. Coordinating computer's activities
   3-3. Application software

4. Networking and the Internet [3 weeks]
   4-1. Network fundamentals
   4-2. The Internet
   4-3. Broadband connections
   4-4. Mobile connections

5. Optional topics: HTML and web pages, algorithm and programmings, etc. [2 weeks]

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Lecture code: T015001
## Course Title

In the current society, we use a variety of information technologies, which have enormous influence on our daily lives, economical activities, industry, public policies, education, and so on. In order to get a higher perspective and a wider view to understand information-based society, we need knowledge of the history of informatics science and technology and their impact on our society.

In this lecture, students will get fundamental knowledge of information technology and the interrelation between information, technology, and society. This lecture course covers topics related to social impacts of ICT and treatment/management of information in our society, including information economics, intellectual property, media literacy, social media, and so on.

### Course Goals

Students will be able to explain social impacts of ICT and treatment/management of information in our society as well as basic issues related to information economy and information society. They will also be able to formulate their own opinions about information technologies, information ethics, and their interplay with society.

### Course Schedule and Contents

1. Introduction to information society: information, information society, Internet, relation of information, society, and technology (about 2 times)

2. Intellectual rights and law: freedom of expression, right to know, right to be forgotten, information privacy as well as intellectual and industrial property rights such as patents and copyrights (about 2 times)

3. Information and economy: economic transactions, search/recommendation models for products, information asymmetry, network externality, lock-in phenomenon, path dependence, electronic payments, e-commerce, advertising on the Internet, impact of Internet on economy (about 3 times)

4. Information and education: information education, computer literacy, media literacy, information literacy, e-learning, MOOC, blended learning, digital divide, e-books (about 2 times)

5. Information archiving: digital content archiving, digital libraries, usage of archived contents, information validity over time (about 1 time)

6. Information design: information systems, search systems for information, information credibility, trust mechanisms (about 1 time)

7. Digital governance: digital democracy, digital community, social media, cloud computing, information policy (about 1 time)

8. Social computing: human computation, crowdsourcing, collective intelligence (about 2 times)

### Class Requirement

None

### Method, Point of View, and Attainment Levels of Evaluation

Students are evaluated by the final exam.

### Textbook

Not used
Slide handouts will be distributed.

### Reference Book, etc.

Reference book introduced during class

### Regarding Studies Out of Class (Preparation and Review)

Students will review materials after classes based on the handouts.

### Others (Office Hour, etc.)

No office hours specified. E-mail: adam@dl.kuis.kyoto-u.ac.jp
Practice of Basic Informatics-E2

[Outline and Purpose of the Course]
The objectives of this course are as follows:
- To teach students to acquire the basic ICT skills needed for academic activities. Students will acquire ICT skills so as to be able to fully utilize the information services provided by the university, to search for the information needed during academic activities, to process data, to write papers, and to present their studies.
- To guide students to be independent ICT users. Students will learn to manage and operate their personal computers and network properly as independent users.
- To help students acquire the capability to learn ICT skills by themselves on an ongoing basis. That is, students will be guided to learn ICT skills not dealt with in this course on their own, as their studies progress.

[Course Goals]
At the end of the semester, students should be able to know the basics of operating systems and in-campus information networks, learn the knowledge of academic information seeking, acquire the skills of data processing, academic writing and presentation, and understand the basics of programming with practice.

[Course Schedule and Contents]
Computer basics (1 week)
- Introduction of this course
- Basics of operating systems
- Basics of information networks (2 weeks)
  - In-campus information services and networks (1 week)
  - Information security and information ethics (1 week)
Academic information seeking (1 week)
- Academic information and libraries
- Skills of information seeking for academic purposes
Academic content creation (6 weeks)
- Data processing with a Spreadsheet (2 weeks)
- Academic report writing (2 weeks)
- Presentation (2 weeks)
Basics of programming (4 weeks)
- Overview of programs and programming (1 week)
- Basic programming exercises (1 week)
- Advanced programming exercises (2 weeks)

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Grading will be based on the evaluation of submitted reports.

[Textbook]
H. Kita, Y. Kitamura, and H. Hioki.  *The Practice of Basic Informatics 2017.* Kyoto University
Slide handouts for additional materials will be delivered.

[Regarding studies out of class (preparation and review)]
Students are expected to read the corresponding materials ahead of each class and practice the acquired knowledge by solving proposed problems during the class. After each class, student will have a full week to write and submit their reports.

[Others (office hour, etc.)]
### [Outline and Purpose of the Course]

Nowadays, in order to conduct state-of-the-art research or development in various fields including also liberal arts and sciences, one needs to know not only fundamental computer skills but also how to process, utilise and analyse large scale and heterogenous information.

This lecture covers fundamentals of "information literacy" and "information utilization" including topics related to collecting, organizing, searching, managing and analyzing information as well as topics related to presenting and visualising information.

The course will provide overview of basic technologies for extracting useful knowledge to perform sophisticated analysis, and will also introduce how to use these technologies in different research fields.

### [Course Goals]

Students will know fundamentals of information retrieval, processing, analysing and presenting and be able to understand when and how computational techniques should be used for solving diverse problems.

### [Course Schedule and Contents]

**Representation of information (about 2 times)**
Topics related to acquisition of information by computers (e.g., analog and digital data, multi-media, sampling theorem), and topics related to representation of information (coding, information amount, entropy, Huffman code, mutual information).

**Processing of information (about 5 times)**
This part contains topics related to the automatic analysis and processing of information. It covers fundamental computing concepts required to solve the problem using computers (algorithms, calculation complexity, etc.), modelling of data (graphs, automata, data structures, regular expressions, Markov process, etc.). In addition, this part will cover issues related to heterogenous data types (audio, image, video, and multimedia processing).

**Search and management of information (about 3 times)**
This part covers topics related to information retrieval (search engines) and storage (relational databases).

**Analysis of information (about 3 times)**
This part covers methods used for analyzing the data, such as effective information and data mining techniques (association rules, clustering techniques, decision trees, etc.) and machine learning approaches.

**Information Design (about 1 time)**
This part will cover data visualization techniques.

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Using the Internet for gathering information, sending e-mails, and online shopping has become a part of everyday life. In this course, students will learn the basic workings of the Internet and how computers communicate across networks. Students will also learn about information security issues and how to avoid potential problems while using the Internet.

**Course Goals**
The students will learn the basics of the Internet and the various protocols used when devices communicate across the network, understand problems involving information security and how to deal with them, and learn the basic rules governing proper use of information networks.

**Course Schedule and Contents**
We will cover the following topics during the course, and spend one or two weeks on each topic:

1. Overview of the Internet
2. Application Layer (World Wide Web, e-mail, etc.)
3. Transport Layer (sockets, TCP and UDP)
4. Network Layer (IP addresses and routing)
5. Link Layer (LANs and Ethernet)
6. Wireless and mobile networks
7. Security
8. Rules of Internet usage

**Class requirement**
No prerequisites are required, but it is recommended that the students take an introductory course such as "Basic Informatics" before this course.

**Method, Point of view, and Attainment levels of Evaluation**
Students will be expected to understand the basic workings of the Internet, information security and proper use of information networks. The student's understanding of these topics will mainly be evaluated by a final report at the end of the course. Evaluation will also be influenced by performance on practice exercises given during the course.

**Textbook**
Relevant materials will be distributed in class, so no textbook is required. However, students who wish to study the topics in more detail are recommended to read the book "Computer Networking" by J. Kurose and K. Ross (see below).

**Reference book, etc.**

ISBN:978-0133594140

**Regarding studies out of class (preparation and review)**
Students should study material related to each topic before class, and review the course material after each class. It is also recommended that students gain first-hand experience of the topics discussed by using computers outside of class.

**Others (office hour, etc.)**

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Lecture code: T019001
### Fundamentals of Discrete Optimization-E2

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<th>Language</th>
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<th>Eligible students</th>
<th>Target year</th>
<th>Day/period</th>
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<td>For all majors</td>
<td>All students</td>
<td>Wed.2</td>
<td>Lecture</td>
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</tbody>
</table>

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

The goal of this course is to introduce students to the field of discrete optimization. This is a non-technical course open to all undergraduate students, which does not require any specific background on mathematics or computer science. What is the shortest path between two places on a roadmap? What is the optimal strategy for delivering packages from a seller to clients? Discrete optimization is a methodology to solve such practical problems, in addition to a wide range of problems arising in science, economy or business. This course will show how to model such tasks as optimization problems and how to solve them in practice.

#### [Course Goals]

At the end of the course, students should know how to solve such practical problems arising in science, economy or business. This course will show how to model such tasks as optimization problems and how to solve them in practice.

#### [Course Schedule and Contents]

1. What is optimization, and why is it important? (1 week)
2. Discrete optimization: how to organize your schedule or pack your bag efficiently? (4 weeks)
3. Heuristics and approximation: practical methods for hard problems (3 weeks)
4. Big data: solving large-scale problems (2 weeks)
5. Pattern recognition: learning from experience (2 weeks)
6. Artificial intelligence: can computers "think"? (2 weeks)

#### [Class requirement]

This is a general non-technical course for all undergraduate students. No specific background from mathematics or computer science is required.

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

Evaluation on submitted reports (three reports during the semester).

#### [Textbook]

Not used

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

The instructor expects students to spend enough time after each class for review. Additionally, mandatory reading material and assignments (3 reports) will be given during the course.

### Introduction to Algorithms-E2

<table>
<thead>
<tr>
<th>Course title</th>
<th>Number of credits</th>
<th>Language</th>
<th>Group</th>
<th>Eligible students</th>
<th>Target year</th>
<th>Day/period</th>
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<tr>
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<td>2</td>
<td>English</td>
<td>Old group Group B</td>
<td>For all majors</td>
<td>All students</td>
<td>Tue.2</td>
<td>Lecture</td>
</tr>
</tbody>
</table>

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

This is an introductory non-technical course on algorithms designed for all undergraduate students, including liberal arts students. The goal of this course is to show how computers can solve practical problems, and especially to give the students a basic understanding of the notion of algorithms, their importance and how they work. All the notions will be motivated by real-life applications.

#### [Course Goals]

At the end of the course, students should understand the importance of algorithms and how they work.

#### [Course Schedule and Contents]

1. What are algorithms, and why should you care? (1 week)
2. How to describe and evaluate algorithms (1 week)
3. Sort and search algorithms: how do search engines work? (3 weeks)
4. Constructing algorithms: some simple but powerful techniques (3 weeks)
5. Graphs algorithms: how to represent practical problems on a computer, and solve them (4 weeks)
6. Easy vs. hard problems: what cannot be computed? (2 weeks)

#### [Class requirement]

This is a general non-technical course for all undergraduate students. No specific background from mathematics or computer science is required.

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

Evaluation on submitted reports (three reports during the semester).

#### [Textbook]

Not used

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

The instructor expects students to spend enough time after each class for review. Additionally, mandatory reading material and assignments (3 reports) will be given during the course.

#### [Others (office hour, etc.)]
Introduction to Basic Concepts of Health Psychology-E2 : Communication Issues and Decision-making in Patient Care

[Outline and Purpose of the Course]
This module will introduce the principle concepts of health psychology and its research basis. Students will develop an understanding of the integration of biomedical and psychosocial models of health care. They will develop knowledge about how health psychology can be incorporated into promotion and maintenance of health. In addition, this module will explore the impact of health psychology on the treatment of chronic illness, pain management and of its role in palliative care. Students will develop knowledge about the impact of health psychology onto the evolution of complex interventions research and its implications for clinical practice.

[Course Goals]
To develop understanding of the concept of health psychology
To understand key theories of illness and its management within health psychology
To explore illness management interventions, communication approaches and decision-making styles in health care
To evaluate of complex interventions
To understand key theories on pain and pain management in relation to chronic illness

[Course Schedule and Contents]
Session 1: Introduction to Health Psychology module
Session 2: Defining health psychology
Session 3: Social- cognitive models in health psychology
Session 4: Individual differences and habits- implications for health
Session 5: Illness related beliefs
Session 6: Health psychology of chronic illness
Session 7: Pain and health psychology
Session 8: Health psychology and palliative care
Session 9: Health psychology and complex interventions
Session 10-11: Group work: comparison between European health care contexts and Japanese contexts
Session 12: Health promotion and intervention
Session 13-15: Presentations- feedback
**Course title**
Structures and Mechanisms of Human Movement-E2

**Affiliated department, Job title, Name**
Graduate School of Medicine Program-Specific Associate Professor PATAKY, Todd

**Group**
Health and Sports

**Field(Classification)**
Health and Sports Sciences (Foundations)

**Language**
English

**Number of weekly time blocks**
1

**Class style**
Lecture

**Course offered year/period**
2018 · First semester

**Day/period**
Fri. 3

**Target year**
Mainly 1st & 2nd year student

**Eligible students**
For all majors

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### [Outline and Purpose of the Course]
This course will apply basic mechanical principles to the study of human movement. Students will learn about the muscle mechanisms which drive human motion, and how they interact with forces from other sources including ligaments, bones and gravity. Principles of human motion analysis equipment will also be explored. Analysis of real experimental data and simple physics simulations will be used to emphasize fundamental and applied biomechanical concepts.

### [Course Goals]
Students will learn the basics of human movement science, with focus on the concepts needed to describe, analyze and simulate human movement. Through software-based assignments they will learn to connect these concepts to real-world problems in human movement. They will also learn to use the industry-standard software package Visual3D.

### [Course Schedule and Contents]
Over this 15-week lecture the following topics will be covered in each class:

1. Kinematics I: 2D Kinematics
2. Kinematics II: 3D Kinematics
3. Kinematics II: 2D Inverse Kinematics
4. Dynamics I: Body Segment Parameters
5. Dynamics II: Forces
6. Dynamics III: Moments
7. Dynamics IV: 2D Inverse Dynamics
8. Muscles I: Electromyography
9. Muscles II: Modeling
10. Muscles III: Computer Simulation
11. Muscles IV: Musculoskeletal Modeling
12. Equipment I: Kinematics
13. Equipment II: Dynamics
14. Equipment III: Electromyography
15. Final Thoughts: Experiment vs. Simulation

### [Class requirement]
None

### [Method, Point of view, and Attainment levels of Evaluation]
Students are expected to produce all in-class demonstrations independently, and to independently complete weekly assignments. Evaluation will be based on the following criteria: attendance and participation (10%), assignments (90%: 15 assignments @ 6% each).

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**Textbook**
None. All necessary materials will be distributed electronically and will be discussed in class.

**Reference book, etc.**

**Related URL**
http://www2.c-motion.com/free/freedown (Free educational version of Visual3D.)

### [Regarding studies out of class (preparation and review)]
There will be a small software-based assignment each week based on lecture content; students should submit these assignments more than one day before the next lecture. Each assignment will use the “Visual3D” software package for Windows (free for educational use).

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Lecture code: U148001
In this course, we will explore the social and environmental factors that affect chronic diseases. In each lecture, we will discuss some social factors using specific chronic diseases as examples (in brackets below). Additionally, national policies of various countries, including Japan, for management of chronic diseases will be discussed. The class format includes lectures, short videos and group discussions of case examples.

**Course Goals**

1. To understand social and environmental determinants of disease and illness.
2. To understand the impact of health policies and how they affect human health.
3. To critically examine how changing public perception may impact chronic diseases.

**Course Schedule and Contents**

In principle, the course will be offered along the following plan. However, order or the number of times for each theme may change depending on the progression of the course or handling on current topics.

1. Course introduction
2. Social class, race/ethnicity and gender as social determinants of health (eg. diabetes and obesity)
3. Ageing as a social determinant of health (eg. Alzheimer’s and Parkinson’s disease)
4. Role of social stress in health (eg. post-traumatic stress disorder)
5. Food as a determinant of health (eg. cardiovascular diseases, cancer and respiratory diseases)
6. Environmental determinants of health (eg. chronic obstructive pulmonary disease)
7. Social factors influencing the decision to seek professional healthcare (eg. Cancer)
8. Impact of medical innovations on health (eg. stroke and age-related diseases)
9 & 10. Impact of government health policy and medical innovation on chronic diseases (eg. cardiovascular diseases)
11. A health policy success story (eg. tobacco and cancer)
12. A health policy failure story (eg. diabetes and obesity)
13. Role of media in social health perception (eg. “health miracles”)
14. Role of legal system in social health perception (eg. alcohol, tobacco and marijuana)

**Class requirement**

None
### Outline and Purpose of the Course

Human anatomy and physiology deals with the structure of organs and the functional interrelationship between organ systems. This course presents an overview of the anatomical structure and function of the human body. It introduces students to the basic physiologic concepts as they relate to normal body function and maintenance of health. Students will also learn basic medical terminology.

### Course Goals

- To understand basic concepts of the human body and explain its organization and functions.
- To identify the structure and functions of major body systems.
- To demonstrate knowledge of basic medical terminology.

### Course Schedule and Contents

The main contents of the course are:

1. The cell and tissues
2. Skin and Body membranes
3. Skeletal System
4. Muscular System
5. Nervous System
6. Endocrine System
7. Blood
8. Cardiovascular System
9. Lymphatic System and Body Defenses
10. Respiratory System
11. Digestive System
12. Urinary System
13. Reproductive System

These topics will be delivered in 14 classes.

### Class requirement

None

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

The course is presented in lecture/discussion format and may include videos and guest speakers.

Grading will be based on quizzes/assignments (60%), and final exam (40%).

*Quiz: Any lecture session may begin with a short quiz. Questions will be drawn from previous lecture sessions, reading assignments, and course objectives. The lowest score will be eliminated. Quizzes are unannounced.

### Textbook

Not used

### Reference book, etc.

(Reference book)

The course may use chapters from textbooks and readings from academic literature. Students will be provided with a list of recommended readings for each topic.

### Regarding studies out of class (preparation and review)

It is to the student advantage to prepare ahead of time and attend all lectures on time.

### Others (office hour, etc.)

* Students who are absent in one of the quizzes, will miss the mark. NO makeup quizzes.

*Please visit KULASIS to find out about office hours.
**Course title**
Nutrition and Health-E2

**Affiliated department, Job title, Name**
Graduate School of Medicine, Assistant Professor, POUDYAL, Hemant

**Group**
Health and Sports

**Field(Classification)**
Health and Sports Sciences (Foundations)

**Language**
English

**Old group**

**Number of weekly time blocks**
1

**Class style**
Lecture

**Course offered year/period**
2018 • Second semester

**Day/period**
Fri. 5

**Target year**
All students

**Eligible students**
For all majors

**Number of credits**
2

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**Outline and Purpose of the Course**

This course provides an overview of fundamental knowledge in food and nutrition. We will cover core nutritional concepts and explore special topics in nutrition using locally and internationally relevant examples. We will learn about major nutrients and their role in health and disease. Through this course, we will learn and develop skills required to understand our diets for healthy living. Students will be required to keep a simple food journal and will apply knowledge gained during the course to estimate energy requirements and assess their diet quality.

**Course Goals**

1. To provide an overview of the major nutrients relevant to human health.
2. Present current evidence for the role of key nutrients in the prevention of chronic diseases.
3. To develop a good understanding of the concept of dietary recommendations.
4. Discuss special topics in nutrition.
5. To be able to estimate energy requirements, qualitatively assess the dietary quality of an individual and plan a healthy diet.

**Course Schedule and Contents**

In principle, the course will be offered along the following plan. However, order or the number of times for each theme may change depending on the progression of the course or handling on current topics.

1. Nutrient and non-nutrient components of a typical Japanese and Western diets
2. Role of nutrients in health and disease
3. Tools for healthy eating: Dietary intake recommendations and food labels
4. Tools for healthy eating: Nutritional assessment
5. Tools for healthy eating: Food Journals
6. Designing a healthful diet-Macronutrients
7. Designing a healthful diet-Micronutrients
8. Nutrients involved in body fluid balance (including alcohol)
9. Nutrition-related disorders: Metabolic Syndrome
10. Eating disorders: Anorexia nervosa and bulimia nervosa
11. Special Topics in Nutrition-Pregnancy, lactation and infant formula
12. Special Topics in Nutrition- Geriatric nutrition
13. Special Topics in Nutrition- Sports nutrition
14. Special Topics in Nutrition- Supplementary and functional foods

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**Lecture code:** U144001

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**Nutrition and Health-E2(2)**

**Class requirement**
None

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

Active class performance 20%
Food journal analysis 40%
Food journal analysis 40%

**[Textbook]**
Not used

**[Reference book, etc.]**
Reference materials will be provided during the class.

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

Students are expected to come to class having completed their food journal.

**[Others (office hour, etc.])**

Please contact the instructor by email if you have any questions. The instructor will also be available for course-related consultation out of lecture hours is requested by the students. Please make an appointment by email (hpoudyal@kuhp.kyoto-u.ac.jp).
Noncommunicable diseases (NCDs) are not passed from person to person. They usually emerge in middle age people after long exposure to an unhealthy lifestyle. NCDs are the leading causes of mortality and disability in the world, but many NCDs can be prevented by reducing common risk factors.

Students will be introduced to the current state of NCDs such as cardiovascular diseases, cancers, respiratory diseases, and diabetes; their risk factors; the socioeconomic impact; and preventive measures for NCDs. This course will address NCDs from public health perspective.

**Course Goals**

* To understand the global burden of the most common noncommunicable diseases
* To understand the common risk factors
* To understand the socioeconomic impact of the most common noncommunicable diseases
* To describe approaches for prevention of the most common noncommunicable diseases

**Course Schedule and Contents**

In principle, the course will cover the following topics:

1. Global overview of non-communicable diseases
2. Cardiovascular diseases
3. Chronic respiratory diseases
4. Cancers
5. Obesity and diabetes
6. Unhealthy diets
7. Physical inactivity
8. Alcohol and tobacco
9. Behavior change and health promotion
10. Social marketing and health promotion
11. Media and technology
12. Prevention and control

Topics will be delivered in one or two lecture sessions according to the progress of the students.

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**Class requirement**

It is NOT a prerequisite, but students are encouraged to take "Sociology of Chronic Diseases" to enhance their understanding of non-communicable diseases.

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

The course is presented in lecture/group discussion format and may include videos and guest speakers.

Grading will be based on in-class participation/Group discussion (40%) and written assignments (60%)

* Further details will be provided in the first session.

**Textbook**

Not used

**Reference book, etc.**

Introduced during class

The course may use chapters from textbooks and readings from academic literature. Students will be provided with a list of recommended readings for each topic.

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

* Students are expected to come to class having completed the assigned reading and writing, and ready to contribute to group discussions.

**Others (office hour, etc.)**

* Students are expected to actively participate in class.

* Please visit KULASIS to find out about office hours.
In our world there is no form of matter more astonishing than the living cell: tiny, fragile, marvelously intricate, continually made afresh, yet preserving in its DNA a record of information dating back more than three billion years, to a time when our planet had barely cooled from the hot materials of the nascent solar system. Ceaselessly re-engineered and diversified by evolution, extraordinarily versatile and adaptable, the cell retains a complex core of self-replicating chemical machinery that is shared and endlessly repeated by every living organism on the face of the Earth in every animal, every leaf, every bacterium in a piece of cheese, every yeast in a vat of wine.

Curiosity, if nothing else, should drive us to study cell biology; we need to understand cell biology to understand ourselves. But there are practical reasons, too, why cell biology should be a part of everyone’s education. We are made of cells, we feed on cells, and our world is made habitable by cells. The challenge for scientists is to deepen our knowledge of cells and find new ways to apply it. All of us, as citizens, need to know something of the subject to grapple with the modern world, from our own health affairs to the great public issues of environmental change, biomedical technologies, agriculture, and epidemic disease.

This course is designed to provide the fundamentals of cell biology that are required by anyone to understand both the biomedical and the broader biological issues that affect our lives.

This course is not recommended for students who already have selected specialized life science courses such as biochemistry and genetics.

[Course Goals]

Students will receive a basic understanding of the organisation and components of the cell.

Knowing how a cell works will make the students aware of how our body works.

By learning cellular biology and metabolism in English, students will acquire the ability to think and explain scientific concepts in English.

[Course Schedule and Contents]

WEEK 1-2, Cells: The Fundamental Units of Life
WEEK 3-4, Chemical Components of Cells
WEEK 5-6, Energy, Catalysis, Enzymes and Biosynthesis
WEEK 7-9, Protein Structure and Function
WEEK 10-11, DNA and chromosomes
WEEK 12-14, DNA replication, repair and recombination

[Class requirement]

There are no requirements, since the lecture will start from the basics!

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

Frequent problems presented orally to the students, in English, to assess their ability to formulate ideas and concepts (20%).
One written mid-term examination, in English, will take place to assess the student’s comprehension of the lecture (40%).
A written final examination, in English, to assess the student's global understanding of the course (40%).

[Textbook]


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

Students should review the textbook after the lecture by answering the questions provided. Reading the textbook in advance may facilitate the comprehension during the lecture.

[Others (office hour, etc.)]

Any questions and requests are welcome by prior arrangements via E-mail.
Since the beginning of Humanity, time and its measurement has always occupied a central position in our minds. Sundials and stone circles are the legacy of early civilizations striving to know the time of day and the time of the seasons.

Despite this keen interest in knowing Time, the existence of an internal biological clock keeping track of time in an autonomous manner but synchronized to the environment has only been recognised towards the end of the 20th century. Since then, the discovery of clock genes and how they can regulate their own expression and that of output gene, leading to ubiquitous circadian rhythms in physiology and behaviour in virtually every organisms studied thus far, has provided a solid base to understand how our health intimately depends on such harmonious rhythms.

This lecture series will explain basic chronobiology, from the history of the discipline to its latest groundbreaking progresses.

Circadian rhythms as well as seasonal rhythms will be explained.

[Course Goals]
Students will gain an understanding of their own biological rhythms and why it is important to respect them. Students will gain insights on the exquisite organisation, in space and in time, of biological systems. Students will cultivate the ability to reason and draw hypotheses from experimental observations.

[Course Schedule and Contents]
SECTION 1: History of chronobiology (1st week)

SECTION 2: Fundamental properties of circadian behaviour (2nd-3th week)

SECTION 3: Molecular bases of Biological Timing
What are the molecular mechanisms of circadian clocks? (4th-6th week)
How can the biological clock regulate physiology? (7th-8th week)
What are circadian-clock related diseases? (9th-10th week)

SECTION 4: Molecular bases of seasonal timing (13th-14th week)
Molecular bases of seasonal timing (11th-12th week)

[Course Offered year/period] 2018 • First semester

[Target year] Mainly 2nd year students

[Eligible students] For science students

[Class requirement] Basic knowledge on biology and physiology needed.

[Method, Point of view, and Attainment levels of Evaluation]
During class, questions related to the content of the course will be asked orally to assess the students ability to formulate ideas and concepts in English (20%).
One mid-term exam, composed of a short essay (40%).
The final exam is composed of problems or questions to be resolved in 15-20 min, followed by a private 5-10 min discussion with the teacher (40%).

[Textbook]
Handouts based on various source specifically tailored for the lecture will be provided.

[Reference book, etc.]
Introduced during class

[Regarding studies out of class (preparation and review)]
There is no need to prepare for the lecture beforehand.
After the lecture, students should review the materials given during the lecture. It will be necessary to do so in order to understand the next lecture.

[Others (office hour, etc.)]
Any questions and requests are welcome by prior arrangements via E-mail.

Lecture code: U137001
**Course title**
Cultural Aspects of Health Care-E2

**Affiliated department, Job title, Name**
Graduate School of Medicine Program-Specific Associate Professor ANAGNOSTOU Despoina

**Group**
Health and Sports

**Field(Classification)**
Health and Sports Sciences(Development)

**Language**
English

**Old group**

**Number of weekly time blocks**
1

**Class style**
Lecture

**Course offered year/period**
2018 • Second semester

**Day/period**
Tue.3

**Target year**
All students

**Eligible students**
For all majors

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**[Outline and Purpose of the Course]**
This module will enable students to develop understanding of how cultures have different systems of health beliefs to explain what causes illness, how it can be cured or treated, and who should be involved in the process. This module will explore the influence of different religions, cultures, beliefs, and ethnic customs on how patients understand health concepts, how they take care of their health, and how they make decisions related to their health. Concepts of medical authority, treatment compliance, decision-making, communication of disease diagnosis and prognosis, communication between health care professionals and patients will be examined within different cultural contexts. This module will enable students to enhance their knowledge about the interplay between culture and health care and of their consequences in clinical practice.

**[Course Goals]**
To understand the concept of culture
To understand the interplay of culture with health care
To explore different cultural contexts and their impact onto health care
To understand the importance of culture in organizing and delivering end of life care

**[Course Schedule and Contents]**
Session 1: Introduction to the module
Session 2: Definition and different approaches to culture
Session 3: Cultural beliefs in health care
Session 4: Communication styles in different cultural contexts
Session 5: Medical authority and treatment compliance
Session 6: Patient autonomy versus family decision making
Session 7: The ethical debates of Euthanasia in different cultural contexts
Session 8: Death and dying issues in different cultural contexts
Session 9-12: Group work: comparison between European culture and Japanese culture in health care
Session 13-15: Presentations- feedback

**[Class requirement]**
None

**[Method, Point of view, and Attainment levels of Evaluation]**
Students will be evaluated via presentations

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**[Textbook]**
Instructed during class
Material will be introduced during the course

**[Reference book, etc.]**
Introduced during class
References will be provided during the course

**[Regarding studies out of class (preparation and review)]**
Preparation is required for the presentations

**[Others (office hour, etc.)]**
Key lectures will be given by the teacher.
Some group work will be introduced to discuss key issues in comparing Japan with the Europe.
Students will give presentations during the last sessions of the course. Instructions for the presentations will be given in class.
It is advisable to participate actively and share views during the class.
Students should make an appointment through e-mail, in the case they need any advice.

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Lecture code: U154001
**Course title**
Introduction to Physiology-E2

**Affiliated department, Job title, Name**
Graduate School of Pharmaceutical Sciences
Program-Specific Senior Lecturer, Jean Michel

**Group**
Health and Sports

**Field(Classification)**
Health and Sports Sciences(Development)

**Language**
English

**Number of weekly time blocks**
1

**Class style**
Lecture

**Course offered year/period**
2018 - Second semester

**Day/period**
Fri.5

**Number of credits**
2

**Target year**
mainly 1st year students

**Eligible students**
For science students

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**Outline and Purpose of the Course**

In our world there is no form of matter more astonishing than the living cell: tiny, fragile, marvelously intricate, continually made afresh, yet preserving in its DNA a record of information dating back more than three billion years, to a time when our planet had barely cooled from the hot materials of the nascent solar system. Ceaselessly re-engineered and diversified by evolution, extraordinarily versatile and adaptable, the cell retains a complex core of self-replicating chemical machinery that is shared and endlessly repeated by every living organism on the face of the Earth in every animal, every leaf, every bacterium in a piece of cheese, every yeast in a vat of wine.

Curiosity, if nothing else, should drive us to study cell biology; we need to understand cell biology to understand ourselves. But there are practical reasons, too, why cell biology should be a part of everyone’s education. We are made of cells, we feed on cells, and our world is made habitable by cells. The challenge for scientists is to deepen our knowledge of cells and find new ways to apply it. All of us, as citizens, need to know something of the subject to grapple with the modern world, from our own health affairs to the great public issues of environmental change, biomedical technologies, agriculture, and epidemic disease.

This course is designed to provide the fundamentals of cell biology that are required by anyone to understand both the biomedical and the broader biological issues that affect our lives.

This course is not recommended for students who already have selected specialized life science courses such as biochemistry and genetics.

**Course Goals**

This course will give a basic understanding of cellular physiology. Students will be able to explain, in English, how the cell is organised and how it functions.

**Course Schedule and Contents**

This lecture will describe cellular physiology in continuity with the course titled "Biology and Metabolism”.

- WEEK 1 - WEEK 2. DNA replication, repair and recombination
- WEEK 3 - WEEK 4. From DNA to protein: How Cells Read the Genome
- WEEK 5 - WEEK 6. Control of Gene expression
- WEEK 7 - WEEK 8. Membrane Structure
- WEEK 9 - WEEK 10. Transport Across Cell Membranes
- WEEK 11 - WEEK 12. How Cells Obtain Energy From Food
- WEEK 13 - WEEK 14. Cell-division cycle

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**Introduction to Physiology-E2(2)**

This schedule may proceed quicker or more slowly than expected, depending on the level and number of the students.

**Class requirement**

Students who have chosen Basic Biology and Metabolism are encouraged to also follow this course.

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

Short oral tests, in English, will take place frequently to assess the student's comprehension of the lecture and their ability to formulate concepts and ideas (20%).

A mid-term examination, in English, to assess the students understanding of the content so far (40%).

A final examination, in English, to assess the students global understanding of the course (40%).

**Textbook**


Handouts based various sources specifically tailored for the lecture will be provided.

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

Reading the textbook before the lecture will help the students to understand the lecture. Students should review the textbook after the lecture and answer the questions provided.

**Others (office hour, etc.)**

Any questions and requests are welcome by prior arrangements via E-mail.
## Introduction to Medical Psychology-E2

### [Outline and Purpose of the Course]

Mind and body cannot be separated from each other: psychological factors have a huge impact on our physical health. This course aims at introducing students to basic psychological concepts that are most relevant for our health. It will discuss how sleep, emotions, personality, and stress influence our well-being and it will demonstrate how psychological factors affect physiological parameters.

### [Course Goals]

- To understand the connection between psychological well-being and our physical health.
- To get a basic understanding of how we can treat psychological and psychosomatic illness.

### [Course Schedule and Contents]

1. Introduction to Medical Psychology
2. Measuring the human mind: psychological tests and psychophysiology
3. Intelligence and learning
4. Personality
5. Sleep
6. Emotions
7. Psychological stress and its role in health and disease
8. Experience of extreme conditions, post-traumatic stress-disorders, anxiety and phobia
9. Chronic pain
10. Depression and suicide
11. Substance abuse and dependence
12. Placebo and nocebo
13. Behavioral intervention strategies for improving health
14. Neurofeedback and brain-machine-interfaces
15. Final examination
16. Feedback

### [Class requirement]

None

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

Evaluation will be based on class attendance and active participation (30 points), short student presentation or report (15 points), and a final examination (55 points). The final examination will test whether students have achieved the course goals. Students who are absent more than five times will not be credited.

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**Lecture code: U135001**
Forbes magazine reports that "seventy percent of employed Americans who give presentations agree that presentation skills are critical to their success at work (...) The other 30% don't know it yet."

In this new global and interconnected world, being able to clearly and succinctly communicate ideas is becoming more and more a basic requirement for success at work. Presentation skills are to the XXI century what English skills were to the XX century: a necessity, rather than a luxury.

The aim of this class is to help you improve your communication proficiency, focusing on presentation and discussion skills in English.

**Course Goals**

At the end of the year, you should be able to present ideas in a concise and orderly manner, in both small and large settings, either individually or as part of a group. The principles behind the use of slideware, sliddocs, color and presentation theory, graphic creation, data delivery, etc., will be introduced during this two semester-long practical class.

**Course Schedule and Contents**

This practical class will divide the learning of presentation skills in the following building blocks:

**FIRST SEMESTER**
1. Guidance
2. Individual Presentations
3. Presentations
4. Preparation
5. Design
6. Delivery
7. Group Preparations
8. Individual Presentations

**SECOND SEMESTER**
1. Exercise
2. Technical Graphics
3. Exercise
4. Sliddocs/Other Media
5. Technical Presentations
6. Final Presentations
Course title: Advanced Scientific English-E3 (Debate)

Affiliated department, Job title, Name

Graduate School of Engineering
Associate Professor, AN RIN
Graduate School of Engineering
Associate Professor, FLORES GIACARLO
Graduate School of Engineering
Associate Professor, KHYYER, Abbas
Graduate School of Engineering
Associate Professor, KIM SUNMIN
Graduate School of Engineering
Associate Professor, KHAYYER, Abbas
Graduate School of Engineering
Associate Professor, KIM SUNMIN
Graduate School of Engineering
Associate Professor, CHANG, Kai-Chun
Graduate School of Engineering
Associate Professor, SCHMÖCKER, Jan-Dirk
Graduate School of Engineering
Associate Professor, QURESHI, Ali Gul
Graduate School of Engineering
Associate Professor, PIPATPONGSA, Thirapong
Graduate School of Engineering
Associate Professor, KHAYYER, Abbas
Graduate School of Engineering
Associate Professor, SCHMÖCKER, Jan-Dirk

Group: Career Development
Field (Classification): International Communication
Language: English
Old group: Group C
Number of credits: 4

Number of weekly time blocks: 1
Class style: Seminar
Course offered year/period: 2018- Year-round
Day/period: Wed.2
Target year: 2nd year students or above
Eligible students: For science students

[Outline and Purpose of the Course]
This course aims at improving students’ expressiveness and their ability to negotiate with others. Debating and negotiating are skills needed in most professions students will enter after graduation. The course aims to improve critical thinking and general abilities to discuss scientific issues.

[Course Goals]
1) To improve students' ability to discuss scientific issues in a set format. Students will learn to defend their opinions and to react to counter-arguments. 2) Students will be introduced to a number of current issues in Civil Engineering through the debate topics.

[Course Schedule and Contents]
The first lectures will give an introduction to the course and to debating: What makes a good debate, introduction to how to prepare for a debate, some helpful tools for organizing the debate, etc.

The course is then split into seven units of four classes each. In each unit some debate topic is given. Students have to choose a role (pro or contra the debate motion) and collect some information and arguments on the topic by reading articles or collecting information from the internet.

In the third class of each unit students are given presentation time to prepare their debate talk and to prepare for potential counter-arguments. In the final classes of each unit students are then performing the actual debate.

Debate topics are chosen by teachers from engineering issues as well as current issues.

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
The grade will be based mainly on the presentations about the debate topics (70%). In addition active participation in the class (20%) and reports (10%) are evaluated.

[Textbook]
No textbook is required for this course. Handouts will be distributed by the instructors as needed.

[Regarding studies out of class (preparation and review)]
Occasionally students will be asked to collect information material for the debates.

[Others (office hour, etc.)]

Lecture code: W227001
[Outline and Purpose of the Course]
Students will be tutored in how to improve their English reading skills, using a variety of texts and exercises. Passages or terms identified as difficult will be analyzed and explained in simpler language, and possible alternatives presented. The structure and content of scientific reports will be examined. Short texts on a range of scientific topics followed by multiple-choice questions will be used to build confidence and understanding. The overall aim is to foster students' abilities to extract the most important content from scientific texts, find specific information, and draw appropriate conclusions.

[Course Goals]
Students will gain experience in reading scientific texts and extracting the most important information from them. They will also learn to identify good and poor scientific writing.

[Course Schedule and Contents]
1. Introduction. Basic grammar and punctuation games
2. Issues in spelling, including American vs. British style
3. Identifying grammatically correct and incorrect statements
4. How to ask, and how not to ask questions in writing
5. Comprehension: extracting important information from texts
6. Comprehension: further exercises in extracting information from texts
7. Comprehension: identifying and retaining facts and concepts
8. Resolving ambiguities in texts
9. Informal in-class exercises
10. Common errors in scientific writing
11. Detecting errors in texts
12. Comparing texts: poor writing and good writing
13. Getting the message across: English on signs and packaging
14. Overview of issues

Note: The contents of specific classes may change.

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on class participation (20%) and a final, multi-component exam (80%).

Textbook
Not used
Lecture notes/slides will be distributed and posted on KULASIS.

Reference book, etc.
Introduced during class.

Regarding studies out of class (preparation and review)
No special preparations are required before or after classes, other than revising the material covered.

Others (office hour, etc.)
There are no specific office hours. My e-mail address is:

j.r.anderson@psy.bun.kyoto-u.ac.jp

Lecture code: W231001
### Business English-E3

- **Course title**: Business English-E3
- **Affiliated department**: Graduate School of Management
- **Job title, Name**: Associate Professor, WILLIAM BABER
- **Group**: Career Development
- **Language**: English
- **Field(Classification)**: International Communication
- **Number of weekly time blocks**: 1
- **Course offered year/period**: 2018 • First semester
- **Day/period**:Tue. 2
- **Class style**: Seminar
- **Number of credits**: 2
- **Eligible students**: For all majors

#### [Outline and Purpose of the Course]
This course is for students with Intermediate to Low-Advanced English skills. Students with higher English skills may not take the course. The course practices English skills that are necessary for business.

#### [Course Goals]
Students will learn about:
- Formal business email
- Informal business email
- Summarizing (verbal and written)
- Short written reports
- Short verbal repesentations to small groups
- Understanding and communicating precise rules

#### [Course Schedule and Contents]
Week 1-3: Criteria for evaluating and communicating about quality
Week 2: Formal and "bad news" email
Week 3: Summarizing
Week 4: Summarizing
Week 5-14: Above skills, presenting, writing, and more.

#### [Class requirement]
Students with English skills below "Intermediate" or above "Low Advanced" will not be accepted. The course is targeted for students with middle level skills.

#### [Method, Point of view, and Attainment levels of Evaluation]
Students are graded based on the number and level of tasks completed.

#### [Textbook]
Materials will be provided by the professor.

#### [Reference book, etc.]
Materials will be provided by the professor.

#### [Regarding studies out of class (preparation and review)]
Some projects will require work at home or outside of the classroom to collect information about businesses and products in Kyoto.

#### [Others (office hour, etc.)]
Office hours: Monday and Friday afternoons by appointment.

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### Business Thinking-E3

- **Course title**: Business Thinking-E3
- **Affiliated department**: Graduate School of Management
- **Job title, Name**: Associate Professor, WILLIAM BABER
- **Group**: Career Development
- **Language**: English
- **Field(Classification)**: International Communication
- **Number of weekly time blocks**: 1
- **Course offered year/period**: 2018 • First semester
- **Day/period**: Wed. 2
- **Class style**: Seminar
- **Number of credits**: 2
- **Eligible students**: For all majors

#### [Outline and Purpose of the Course]
This course teaches some core approaches to thinking about business: understanding quality; understanding user reactions to products; understanding business models; and so on.

#### [Course Goals]
Students will learn about:
- defining and communicating quality
- product attribute mapping
- Business Model Canvas

#### [Course Schedule and Contents]
Week 1-3: Criteria for evaluating and communicating about quality
Week 4-6: Business Process Mapping
Week 7-10: Business Model Canvas
Week 11-13: Business structures
Week 14: In class presentations and course summary

#### [Class requirement]
None

#### [Method, Point of view, and Attainment levels of Evaluation]
Strong English speaking skills will be necessary. Students are expected to work in small groups in English weekly, and to make presentations to the class at least three times in the semester.

#### [Textbook]
Materials will be provided by the professor.

#### [Reference book, etc.]
Materials will be provided by the professor.

#### [Regarding studies out of class (preparation and review)]
Students are expected to complete tasks outside of class and in class. Class time is mainly for support, questioning, and skills review with the professor.

#### [Others (office hour, etc.)]
In class meetings:
Size limit: 20 students
Size is limited in order to allow time for frequent interaction with the professor.
**Course title:** Scientific Writing and Presenting in English-E3

**Affiliated department, Job title, Name:** Graduate School of Letters, Professor, Anderson, James Russell

**Group:** Career Development  
**Field (Classification):** International Communication

**Language:** English  
**Old group:**  
**Number of weekly time blocks:** 1  
**Class style:**  
**Course offered year/period:** 2018 - Second semester

**Eligible students:** For all majors

**Day/period:** Thu. 1  
**Target year:** 2nd year students or above

---

**Outline and Purpose of the Course**

Students will be introduced to issues surrounding scientific writing and presenting. Topics will include how to avoid some of the most common errors of expression (both written and oral), through the use of examples and opportunities to practice. Focus will be on how to structure a scientific report and to write concisely in English, again with help from real-life examples. Teaching will include open discussions and opportunities for students to participate in “mini-symposia” as both presenters and discussants.

---

**Course Goals**

Students completing the course will have improved knowledge of the structure of scientific papers and presentations, as well as clearer ideas of what to do and what not to do to write or present successfully in English.

---

**Course Schedule and Contents**

1. Introduction. Aims of scientific writing  
2. Common errors to avoid when writing  
3. Basic structure of psychology research papers  
4. Writing in concise English  
5. In-class construction of a report  
6. Critical analysis of sample manuscripts  
7. In-class exercises  
8. Introduction to presenting in English  
9. Some presentation hints  
10. Visual aids: good and not so good  
11. Asking questions, and responding orally in English  
12. Student mini-symposium 1 (presentations, questions in English)  
13. Student mini-symposium 2 (presentations, questions in English)  
14. Overview of course

Note: The contents of specific lectures may change.

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**Class requirement**

None

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

Evaluation will be based on class participation (20%), a short oral presentation (10%) and a final written exam (70%).

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**Textbook**

Not used  
Class notes/slides will be distributed.

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

Students are expected to review the class hand-outs after each class.

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**Others (office hour, etc.)**

There are no specific office hours. My e-mail address is:  
j.r.anderson@psy.bun.kyoto-u.ac.jp

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Scientific Writing and Presenting in English

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Lecture code: W232001
**Business English-E3**

**Group**
Career Development

**Field (Classification)**
International Communication

**Language**
English

**Old group**

**Number of weekly time blocks**
1

**Class style**
Seminar

**Course offered year/period**
2018 • Second semester

**Day/period**
Thu.4

**Target year**
2nd year students or above

**Eligible students**
For all majors

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**Negotiation-E3**

**Group**
Career Development

**Field (Classification)**
International Communication

**Language**
English

**Old group**

**Number of weekly time blocks**
1

**Class style**
Seminar

**Course offered year/period**
2018 • Second semester

**Day/period**
Wed.4

**Target year**
2nd year students or above

**Eligible students**
For all majors

---

[Outline and Purpose of the Course]
This course is for students with Intermediate to Low-Advanced English skills. Students with higher English skills may not take the course. The course practices English skills that are necessary for business.

[Course Goals]
Students will learn about:
- Formal business email
- Informal business email
- Summarizing (verbal and written)
- Short written reports
- Short verbal presentations to small groups
- Understanding and communicating precise rules

[Course Schedule and Contents]
Course Schedule and Contents
Week 1: Informal work email, speaking skills
Week 2: Formal and “bad news” email
Week 3: Summarizing
Week 4: Summarizing
Week 5-14: Above skills, presenting, writing, and more.

[Class requirement]
Students with English skills below “Intermediate” or above “Low Advanced” will not be accepted. The course is targeted for students with middle level skills.

[Method, Point of view, and Attainment levels of Evaluation]
Ongoing evaluation of skills in class including verbal and written assignments.

[Textbook]
Baber, Chen Practical Business Negotiation. (Routledge) ISBN:9781138781481

[Regarding studies out of class (preparation and review)]
Office hours: Monday and Friday afternoons by appointment.
**Course title**: Chemistry, Society and Environment-E2

Chemistry, Society and Environment-E2

**Affiliated department, Job title, Name**
Graduate School of Energy Science
Associate Professor, MCELLAN, Benjamin

**Group**
Interdisciplinary Sciences

**Field(Classification)**
Environmental Sciences

**Language**
English

**Old group**
Group B

**Number of credits**
2

**Number of weekly time blocks**
1

**Class style**
Lecture

**Course offered year/period**
2018 • First semester

**Day/period**
Wed. 2

**Target year**
Mainly 1st & 2nd year students

**Eligible students**
For science students

---

**Course Goals**
Students will understand the importance of chemistry and its role in the modern world. Students will understand the importance of chemistry in relation to societal goals and environmental issues.

---

**Course Schedule and Contents**
The following topics will be covered (each numbered item is expected to be one week of class unless otherwise highlighted).

1. The history of chemistry and its influence on society
2. The scale of chemical industries and the comparison with global flows

Introduction to the basics of important chemical processes:

3. Energy chemistry (2 weeks)
4. Water chemistry (2 weeks)
5. Petrochemistry
6. Pharmaceuticals / health chemistry
7. Mineral chemistry

Environmental issues and chemistry

8. Global warming impacts
9. Local chemical pollution
10. Chemical solutions to environmental problems (2 weeks)

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**Class requirement**
No specific chemical background is needed
Some basic chemical processes will be introduced, but chemistry knowledge will only be assessed in the context of the issues discussed.

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**Method, Point of view, and Attainment levels of Evaluation**
Participation and small exercises (40%)
Final exam or assignment (60%)

**Textbook**
Not fixed

**Reference book, etc.**
Introduced during class

**Regarding studies out of class [preparation and review]**
Small exercises out of class may be expected.
Class slides will be provided for pre-reading.

**Others [office hour, etc.]**
Typically lectures will be given in class on campus.
Consultation is available by prior arrangement.

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Lecture code: Y208001
Introduction to Sustainable Development-E2

[Outline and Purpose of the Course]
Sustainable development tries to satisfy people's present needs while maintaining the ability of future generations to meet their own needs. In this course we will explore how nations can try to balance growth with environmental health.

[Course Goals]
Students will gain an understanding of the core principles of sustainable development and their application through global and local case studies. At the conclusion of the course students will present their own development project proposals to the class.

[Course Schedule and Contents]
This course will cover the following topics:
1. Introduction: Definition and principles of sustainable development (Singer)
2. Identifying developed/developing countries and the goals of development (Singer)
3. History of development and ODA, why some countries succeed (Singer)
4. Population, migration and urbanization (Singer)
5. Food, agriculture and rural issues (Singer)
6. Natural capital (water and other resources, ecosystem services) (McLellan)
7. Social capital (stakeholders, cultural sustainability) (McLellan)
8. Energy issues (McLellan)
9. Business, trade and globalization (McLellan)
10. Global treaties, climate change and fair trade (McLellan)
11. Case studies from Japan and the world (McLellan)
12. Proposal preparation (Singer)
13. Student development proposals (Singer/McLellan)
14. Student development proposals and conclusion (Singer/McLellan)

[Class requirement]
Enthusiasm about the topic and willingness to share ideas in class.

[Method, Point of view, and Attainment levels of Evaluation]
1. Attendance and participation: 30%
2. In-class exercises and short assignments: 30%
3. Final presentations: 40%

Standard scoring scale will be applied

[Textbook]
Not used

[Reference book, etc.]
Richard Heinberg, Daniel Lerch 『The Post Carbon Reader: Managing the 21st Century's Sustainability Crises』 (Watershed Media) ISBN:978-0-9709500-6-2 (Not compulsory, but highly recommended.)

[Regarding studies out of class (preparation and review)]
Final presentation requires students to spend time out of class hours in preparation.

[Others (office hour, etc.)]

Lecture code: Y213001
Outline and Purpose of the Course
This lecture-discussion course will introduce students to environmental studies with a focus on human-environmental interactions. We will apply an ecosystem framework to understand the drivers of environmental change, their natural and human impacts, and some possible approaches to ensure long-term sustainability.

Course Goals
Students will be encouraged to look critically at the environmental impacts of their own behavior as well as practices on the local, regional, national and international scale. They will consider such concepts as environmental ethics and environmental justice in relation to our obligations to each other and the natural world. Students will be expected to contribute their ideas and express themselves in small group discussions and classroom exercises.

Course Schedule and Contents
Each ecosystem will be the focus of study for approximately two weeks:

Week 1: Course introduction. Environmental ethics
Week 2: The state of ecosystems today: Defining ecosystem tradeoffs, products and services
Week 3-4: Agroecosystems: Food supplies and food security, food production and livelihoods
Week 5: Freshwater and coastal ecosystems: Impacts of pollution, dams
Week 6: Natural disasters and environmental justice
Week 7-8: Midterm exam. Forest ecosystems: Impacts of deforestation and forest neglect
Week 9-10: Grasslands and arid lands: Overuse of natural resources
Week 11: The global ecosystem: Climate change, population and energy issues
Week 12: Presentation preparation
Week 13: Presentation preparation
Week 14: Group or individual presentations
Note: The schedule may change slightly depending on class requirements

Class requirement
None
### Course title
Sustainable Forest Environment-E2

### Affiliated department, Job title, Name
Graduate School of Agriculture Assistant Professor, VILAYVONG, Khonesavanh

### Group
Interdisciplinary Sciences

### Field(Classification)
Environmental Sciences

### Number of weekly time blocks
1

### Language
English

### Old group

### Number of credits
2

### Course offered year/period
2018 • First semester

### Day/period
Thu.2

### Target year
Nearly 1st & 2nd year student

### Eligible students
For all majors

### [Outline and Purpose of the Course]
This course introduces the basic forest environmental issues and concepts concerning the forest sustainability. The course is focused on (1) the basic physical science of climate change, climate models, and the impacts of climate change; (2) basic science on forest environment and ecosystems; (3) roles of forests and forest environmental issues; and (4) Sustainable approach of managing forests by the concept of “Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests, and enhancement of carbon stocks in developing countries (REDD+)”.

### [Course Goals]
1. To introduce students with knowledge and background on environmental issues related to climate change
2. To introduce students with underlying scientific theories, principles, practices, and measures for sustainable forest management
3. To help students acquire and apply technical knowledge and development practices on management practices for mitigation and adaptation to climate change in forest environment

### [Course Schedule and Contents]
1. Global warming
2. Modelling the climate
3. Climate change and its impacts
4. Forests and forest ecosystems
5. Forest environment and its environmental values
6. Forest ecosystem functions
   - Forest soils and nutrient cycles
   - Basic forest hydrology: water supply and quality
8. Forest biodiversity
9. Natural hazards and risk management
10. Deforestation and forest degradation
11. Forests and sustainable development
12. Social values of forests and forestry
13. Forest products
14. Sustainable forest management
15. Examination
16. Feedback

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**Sustainable Forest Environment-E2(2)**

### [Class requirement]
None

### [Method, Point of view, and Attainment levels of Evaluation]
Students’ evaluation are conducted on the performance basis on (1) applying knowledge through answering mini-quizzes (15%); (2) developing scientific communication skills through writing summary reports of book chapters, research papers and oral presentation (25%); (3) writing a short essay of a case study using critical & problem-solving skills (10%); (4) final examination (50%)

### [Textbook]
Reading materials and handouts will be distributed.

### [Reference book, etc.]
- IPCC / Climate Change 2013: The Physical Science Basis / IPCC / (Available online and in library)

### [Regarding studies out of class (preparation and review)]
Students are encouraged to read and review reading materials before classes.

### [Others (office hour, etc.)]
After class, student consultation will be arranged with prior notice.
Insect-human Interactions-E2(2)

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
50% in class discussion, 30% term paper, 20% presentation

[Textbook]

[Reference book, etc.]
Introduced during class to be announced according to the content of a given class each week

[Regarding studies out of class (preparation and review)]
Students are encouraged to preview lecture materials and participate in class discussion, as lecture materials and most of the supplementary readings will be posted on KULASIS and PandA at least 1 day in advance.

[Others (office hour, etc.)]
Lecturer: Chin-Cheng Yang (ccyang@rish.kyoto-u.ac.jp)
Office: HW 412, Research Building No. 1, Uji Campus
Office hours: to be announced
Note: There is a possibility that the instructor may organize a field trip that normally is a one-day event on the weekend, instead of the regular slot of this lecture. The lecturer will discuss date and time with students for the field trip at the beginning of the semester. Students are advised to pay the travel expense. Also, be advised to obtain the insurance for study and research "Personal Accident Insurance for Students Pursuing Ed. & Rsch." if you decide to take the class.

Outline and Purpose of the Course
The purpose of this course is to promote students' understanding of insects in our surroundings. The lecture will start with fundamentals of insects, followed by an introduction to "bad" or "good" insects from the human perspectives. The course will focus student's attention on
1. how important insects are in our daily life;
2. how insects threaten our life quality;
3. how human manipulate insect populations to restore the balance between the two parties.

Examples from classic case studies will be utilized to bridge non-biology background students with the course content. Hands-on sections and possibly a field trip will be conducted to facilitate students' awareness and knowledge of the common insects in the daily life.

Course Goals
The expectations and goals for the students taking this course are
1. students can get to understand "benefits" and "threats" of insects to mankind;
2. to understand how insects are related to human and our society;
3. eventually pay more attention/respect on this group of creatures.

Course Schedule and Contents
- Week 01: Course introduction
- Week 02: What are insects?
- Week 03: Insect vs. human
- Week 04: Good insects: Let's eat insects, shall we?
- Week 05: Good insects: Insect-inspired products in our daily life
- Week 06: Good insects: Insects as ecosystem service providers
- Week 07: Good insects: Biological control using insects
- Week 08: Insect collection trip (@Yoshida campus)
- Week 09: Bad insects: Insects that vector disease
- Week 10: Bad insects: Insects as nuisance pest/entomophobia
- Week 11: Bad insects: Venomous & poisonous insects
- Week 12: Bad insects: Insects that compete for food with humans
- Week 13: Student oral presentation 01
- Week 14: Student oral presentation 02
- Week 15: Term paper
- Week 16: Feedback

Note: "Personal Accident Insurance for Students Pursuing Ed. & Rsch." if you decide to take the class.
Course title: Introduction to Food Sustainability-E2

Affiliated department, Job title, Name: Graduate School of Agriculture, Associate Professor, Garry John PILLER

Group: Interdisciplinary Sciences
Field(Classification): Environmental Sciences

Language: English
Old group: No
Number of credits: 2
Number of weekly time blocks: 1
Class style: Lecture
Course offered year/period: 2018 • Second semester

Day/period: Thu. 2
Target year: Mainly 1st & 2nd year students
Eligible students: For all majors

[Outline and Purpose of the Course]
In this course an interdisciplinary, systems approach is taken to gain a working knowledge of the historical, social and ecological foundations of sustainability. In addition, we will explore emerging challenges presented by climate change, resource depletion, and the constraints imposed on modern food systems from an Asian perspective.

[Course Goals]
The expectations and goals for the students taking this course are as follows:
1. Be able to define and explain key issues in sustainable food systems from multiple perspectives.
2. Develop their critical and reflective thinking skills related to food, environmental, economical and social interactions.
3. Develop effective communication skills and be able to engage in thoughtful discussion of current food security issues

[Class Schedule and Contents]

Class Schedule
1. Introduction
2. Origins of Sustainability
3. Tragedy of the Commons
4. Population Growth & Urbanization
5. Economic Development → Changes in Dietary Patterns
6. Food Security/ Sovereignty
7. Climate Change & its Impacts
8. Food: Biodiversity
9. Food: Water
10. Food: Energy
11. Food: Fertilizers
12. Food: Land & Soils
13. Food: Environmental Impacts/ Waste
14. Emerging Issues: Biotechnology, Biofuels

Feedback

[Class requirement]
None

Lecture code: Y212001
[Outline and Purpose of the Course]  
This course will give students an introduction to the utilization of natural resources and natural disasters in the earth that impact humanity and life in general. The aim of this course will emphasize the fundamental scientific principles to explain current technical issues and impacts of climate change on water related disasters in the world such as flood, high tide, tsunami, landslides, severe weather, and sediment related disasters. Historic catastrophes will be emphasized. Based on these understandings, all students will study causes, effects, and options available to predict, control, and mitigate natural disasters and social scientific approaches. Examples from recent and ancient history will be used and, whenever possible, Japanese examples will be identified. Knowledge gained in this course will allow for a better understand the world around us and a greater appreciation of the potential issues moving forward for humans.

[Course Goals]  
By the end of this course student will:  
- Understanding of the world around us and a greater appreciation of the potential issues moving forward for humans.  
- Be able to distinguish and analyze various types of natural disasters  
- Be able to identify causes and assess significance of natural disasters for human  
- Be able to gain analytical skills for how to develop strategies for prediction, mitigation of flooding, climate change impacts and sedimentation disasters

[Course Schedule and Contents]  
Week1: Introduction to Natural Disasters and Hazards  
Week2: Disaster Risk Reduction, Management and Risk Assessment  
Week3-4: Geological Hazards: Earthquakes Causes, Measurements, Mitigation and Risks  
Week5: Climate Change and Global Warming  
Week6: Understanding Natural Disasters: Focus on Tropical Cyclones  
Week7: Report and Group Presentations  
Week8-9: Flooding as a Hazard: Monitoring, Prediction, and Mitigation Measures  
Week10: Tsunamis: Physics, Modelling, and Engineering Solutions for Hazard Mitigation  
Week11: Coastal Hazards  
Week12-13: Landslides and Debris Flow Disaster: Monitoring, Prediction, and Mitigation  
Week14: Warning and Evacuation  
Week15: Revision and Summary (group presentation)  
* Feedback

Lecture code: Y214001
<table>
<thead>
<tr>
<th>Course title</th>
<th>Introduction to Sustainable Development-E2</th>
</tr>
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<tbody>
<tr>
<td>Affiliated department, Job title, Name</td>
<td>Graduate School of Global Environmental Studies, Associate Professor, SINGER JANE</td>
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<td>Graduate School of Energy Science, Associate Professor, MCLELLAN, Benjamin</td>
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<td>Group</td>
<td>Interdisciplinary Sciences</td>
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<td>Field(Classification)</td>
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<td>Class style</td>
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<td>2018 • Second semester</td>
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<td>Day/period</td>
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<td>Target year</td>
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<tr>
<td>Eligible students</td>
<td>For all majors</td>
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</table>

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

Sustainable development tries to satisfy people's present needs while maintaining the ability of future generations to meet their own needs. In this course we will explore how nations can try to balance growth with environmental health.

**[Course Goals]**

Students will gain an understanding of the core principles of sustainable development and their application through global and local case studies. At the conclusion of the course students will present their own development project proposals to the class.

**[Course Schedule and Contents]**

This course will cover the following topics:

1. Introduction: Definition and principles of sustainable development (Singer)
2. Identifying developed/developing countries and the goals of development (Singer)
3. History of development and ODA, why some countries succeed (Singer)
4. Population, migration and urbanization (Singer)
5. Food, agriculture and rural issues (Singer)
6. Natural capital (water and other resources, ecosystem services) (McLellan)
7. Social capital (stakeholders, cultural sustainability) (McLellan)
8. Energy issues (McLellan)
9. Business, trade and globalization (McLellan)
10. Global treaties, climate change and fair trade (McLellan)
11. Case studies from Japan and the world (McLellan)
12. Proposal preparation (Singer)
13. Student development proposals (Singer/McLellan)
14. Student development proposals and conclusion (Singer/McLellan)

**[Class requirement]**

Enthusiasm about the topic and willingness to share ideas in class.

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

1. Attendance and participation: 30%
2. In-class exercises and short assignments: 30%
3. Final presentations: 40%

**[Textbook]**

Not used

**[Reference book, etc.]**


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

Final presentations requires students to spend time out of class hours in preparation.

**[Others (office hour, etc.)]**

Please contact the instructor to set up an office meeting. You will be informed of the instructor's email address in class.

Lecture code: Y213002
The purpose of this introductory course is to provide students a fundamental understanding of biological invasions as invasive alien species represent the 2nd severest threat on Earth's ecosystems. This lecture will introduce various red-flag invasive species (e.g., fire ants, cane toad) that have been introduced into Japan and other parts of the world and focus on how these species impact the ecosystem. In addition to lectures, students will have opportunities to explore the invasive species through a diverse set of practices including field trip (campus or national park), movie and hands-on section.

**Course Goals**

Students will gain an understanding of the core principles of biology and management of invasive species from infamous examples (e.g., fire ants, cane toad). The ultimate goal is to have students confront the problems that we human beings have been ignoring and thus facilitate the global attention on this costly issue.

**Course Schedule and Contents**

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</table>

**Class requirement**

None

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

50% in-class discussion; 30% term paper; 20% presentation

**Textbook**

MA Davis Invasion biology (Oxford University Press, 2009)

**Reference book, etc.**

MN Clout, PA Williams Invasive species management: a handbook of principles and techniques (Oxford University Press, 2009)

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

Students are encouraged to preview lecture materials and participate in class discussion, as lecture materials and most of the supplementary readings will be posted on KULASIS and PandA at least 1 day in advance.

**Others (office hour, etc.)**

Lecturer: Chin-Cheng Yang (ccyang@rish.kyoto-u.ac.jp)
Office: HW 412, Research Building No. 1, Uji Campus
Office hours: to be announced

Note: There is a possibility that the instructor may organize a field trip that normally is a one-day event on the weekend, instead of the regular slot of this lecture. The lecturer will discuss date and time with students for the field trip at the beginning of the semester. Students are advised to pay the travel expense. Also, be advised to obtain the insurance for study and research "Personal Accident Insurance for Students Pursuing Ed. & Rsch." if you decide to take the class.

---

Lecture code: Y211001
ILAS Seminar-E2: Clinical and ethical issues within palliative care - the European Context

[Outline and Purpose of the Course]
The overall aim of the seminar is to develop understanding of the key current clinical and ethical issues in palliative care within the European context.

We will use a combination of short lectures, interactive group work problem based activities and personal reflection throughout the course to address aspects of shared decision-making in palliative care, communication challenges in end of life care, ethical issues as viewed within EUROPE, holistic needs assessment and management of complex family interactions.

[Course Goals]
To understand the concepts of palliative and end of life care
To understand the different models of palliative care within Europe
To develop awareness of the different disease groups relevant to palliative care
To develop awareness of the current ethical debates within palliative care in Europe

[Course Schedule and Contents]
Session 1: Introduction of the seminar and of those participating
Session 2-3: Deflation and different approaches to palliative care/ end of life care
Session 3-6: The development of palliative care and end of life care in Europe - history of palliative care and how it changed over time
Session 7-9: Current debates in palliative care - deferent models of care
Session 10-12: Small group work - preparation for presentations
Session 13-14: Ethical issues in palliative care
Session 15: Presentations - feedback

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
evaluation will be based on students' presentations

[Textbook]
Instructed during class

[Reference book, etc.]
- (Reference book)
  Introduced during class
  References to relevant literature will be given at each seminar

[Regarding studies out of class (preparation and review)]
Students are required to prepare for their presentations

[Others (office hour, etc.)]
Teacher short lectures, discussion groups, student presentations, small group works during seminar session based on an issue specified by the teacher.

Students are advised to actively participate; make comments and ask questions to generate discussions

Students should make an appointment via e-mail, in the case they need any advice.
| **Course title** | ILAS Seminar-E2: Frontiers in Theoretical Physics I  
Yukawa Institute for Theoretical Physics  
Associate Professor, Antonio De Felice |
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<td><strong>Target year</strong></td>
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<td><strong>Classroom</strong></td>
<td>305, 3F Yukawa Institute for Theoretical Physics (North Campus)</td>
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<tr>
<td><strong>Language</strong></td>
<td>English</td>
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<tr>
<td><strong>Keyword</strong></td>
<td>Theoretical Physics / 理論物理学 / modern physics / 現代物理学</td>
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</tbody>
</table>

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

This will be in the form of a small class (around 7 students). The purpose is to learning interactively various up-to-date topics in theoretical physics. Topics will be taken from journals like Physics Today, Physics World, Nature etc.. The topics taken in this course are different from those in the course "Frontiers in Theoretical Physics II".

**[Course Goals]**

The students will be able to read an article from some journal and enucleate the main message from it. The student will closely interact with professor and other students, so that ideas/comments can be exchanged.

**[Course Schedule and Contents]**

1. Each of us would read in turn a paper and report her/his impressions to the other people.
2. The paper will be freely chosen consistently with field of theoretical physics.
3. In case the paper requires more work, analysis, the same paper can be discussed in groups.
4. As for the paper, the student must be able to get the key-message and show to the others why the paper might (or might not) be of importance in theoretical physics.
5. Share comments, and toss out possible new ideas to expand the idea of the original paper.

**[Class requirement]**

None

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

Discussion in class.

**[Textbook]**

Instructed during class

**[Reference book, etc.]**

(Reference book) Introduced during class

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

The students will be given a paper to read a week before class, and, in turn, they will present and discuss it with other students.

**[Others (office hour, etc.)]**

Lecture code: Z002008
[Outline and Purpose of the Course]
Field research is an essential component of ecology because without it we could not compile models and test hypotheses. In this course we will use field techniques such as point counts to obtain a data set from different parts of the urban environment in Kyoto to make comparisons among them in order to understand what species live in these different areas and how the environment can be related to their natural history. Students will work in teams and collect data and then data will be pooled and analyzed in class. Students will work as teams for their presentations, but will submit their own written report.

[Course Goals]
1) Learn to identify birds in Kyoto and surrounding areas
2) Learn how to conduct a scientific experiment
3) Learn some facets of avian natural history
4) Data analysis and presentation
5) How to write a scientific report in English using the data we collected

[Course Schedule and Contents]
1) Course introduction, designing an experiment
2) How to design a field experiment.
3) Identifying birds
4) Identifying birds
5) Collecting data
6) Collecting data
7) Collecting data
8) Collecting data
9) Collation and data exploration
10) Data analysis
11) Writing an abstract and introduction
12) Methods and results
13) Discussion and conclusions
14) Peer review
15) Group presentations
16) Feedback

[Class requirement]
Understanding of high school biology is recommended.

[Method, Point of view, and Attainment levels of Evaluation]
Assessment will comprise of class attendance (10%), participation in data collection and in class activities (40%), and a final presentation and report (50%).

[Textbook]
Reading materials distributed during classes.

[Reference book, etc.]
M. Brazil 『Birds of East Asia』 (Princeton University Press)

[Regarding studies out of class (preparation and review)]
To achieve the course goals students should review the course materials plus optionally the recommended readings after each class. The time necessary for review should be in the range of 2-3 hours per class.

[Others (office hour, etc.)]
Take out accident insurance. (Partial Refund of Premium Paid for Personal Accident Insurance for Students Pursuing Education and Research (Gakkensai))
ILAS Seminar-E2: Contemporary History

Affiliated department, Job title, Name
Graduate School of Human and Environmental Studies Program Specific Senior Lecturer, BHATTE, Pallavi Kamlakar

Group
Seminars in Liberal Arts and Sciences

Number of credits
2

Number of weekly time blocks
1

Class style
Seminar

Course offered year/period
2018 • First semester

Target year
Mainly 1st year students

Eligible students
For all majors

Day/period
Tue. 5

Classroom
216, Yoshida-South Campus Academic Center Bldg.

Language
English

Keyword
Nationalism / Independence Movements / Decolonization / Imperialism / Colonialism

[Outline and Purpose of the Course]
This is an undergraduate introductory course, providing students an understanding of nationalist and independence movements.

This course aims to help students:
1. Acquire various academic language skills necessary to develop reading, thinking and writing in English.
2. In using Primary and Secondary Sources effectively.
3. In areas such as acquisition of historical analysis, interpretation, and content literacy skills.

[Course Goals]
The ultimate goal of this course is to provide a platform for students to engage in investigating significant questions and debates in Contemporary History.

[Course Schedule and Contents]
The course will cover themes relating to Nationalist and Independence movements in Africa and Asia and post-1945 Central European States.

Week 1: Introduction to the Course and Overview

Case Study on five States mentioned below:
Week 2 to Week 4: Zimbabwe
Week 5 to Week 7: India & Pakistan
Week 8 to Week 10: Vietnam
Week 11 to Week 13: Czechoslovakia
Week 14: Poland

Final week: Feedback & Summary of the Course

*Note: This syllabus will be subject to changes and/or revisions

[Class requirement]
There are no prerequisites.

[Method, Point of view, and Attainment levels of Evaluation]
Method:
Giving students exposure to academic writing and enabling them to understand the basic rules thereof.
1. Providing students with opportunities to receive guidance on academic writing skills.
2. Providing students with opportunities for discussions.

Evaluation:
Students are evaluated by reports (100%) submitted on any 4 Case Study topics dealt with in the Course.

[Textbook]
Not used

[Reference book, etc.]
University of Chicago Press

The Chicago Manual of Style 16th Ed


[Regarding studies out of class (preparation and review)]
No prior knowledge of history is required. Students should be able to participate in discussions with their classmates in English.

[Others (office hour, etc.)]
No office hours specified. Meetings are to be arranged by appointment.
Any new information and instructions will be communicated in class or through electronic medium.

Classroom Management:
Be respectful to everyone and everything in class.
**Course title**
ILAS Seminar-E2: Introduction to the biology of nematodes

**Affiliated department, Job title, Name**
Graduate School of Biostudies
Associate Professor, CARLTON, Peter

**Group**
Seminars in Liberal Arts and Sciences

**Number of credits**
2

**Number of weekly time blocks**
1

**Class style**
Seminar

**Course offered year/period**
2018 • First semester

**Quota (Freshman)**
15 (10)

**Target year**
Mainly 1st year students

**Eligible students**
For all majors

**Day/period**
Thu. 5

**Classroom**
FB, Yoshida-South Campus Academic Center Bldg. North Wing

**Language**
English

**Keyword**
biology / genetics

**Outline and Purpose of the Course**
This class will introduce to students one of the most abundant forms of life on earth: the Nematodes or roundworms. The most famous of these is the useful model organism called Caenorhabditis elegans. The goal of the class is to provide both a survey of how scientists use the worm to conduct research, demonstrate the worm's great importance to biology, and provide hands-on experience with simple worm manipulation. Students will learn directly about some of the current biological questions that are being addressed with this versatile model organism. We will also find wild nematodes around Kyoto, make scientific observations on them and use DNA sequencing to identify their species. This small seminar will combine instruction with in-class demonstrations.

**Course Goals**
- To understand the biology and diversity of nematodes
- To understand the uses of the nematode Caenorhabditis elegans in modern biological research
- To understand the anatomy and life cycle of C. elegans
- To learn how to create new strains containing desired mutations by designing crosses between animals
- To acquire the knowledge and experience needed to begin genetic research with C. elegans

**Course Schedule and Contents**
1. Overview of the course; nematodes and the place of C. elegans in the tree of life
2. Development, anatomy, and life cycle (I)
3. Development, anatomy, and life cycle (II)
4. Wild Worms of Kyoto (I): worm collecting
5. Mutants with observable phenotypes (with microscopy observation)
6. Basic worm genetics: selfing and crossing (with microscopy observation)
7. Meiosis part 1: how chromosomes pair
8. Meiosis part 2: how chromosomes recombine
9. Mapping genetic mutations
10. Reverse genetics: genome editing
11. Sex determination and dosage compensation
12. Wild Worms of Kyoto (II): observation
13. Wild Worms of Kyoto (III): DNA sequencing
14. The whole genome sequence of C. elegans and its relatives
15. Using nematode diversity to discover new biology

**Class requirement**
This is an introductory course. There are no requirements, but a basic familiarity with biology and genetics will be beneficial.

**Method, Point of view, and Attainment levels of Evaluation**
Evaluations will be based on participation, short quizzes, and either a final exam or a term paper. Each area will contribute 1/3rd of the total grade.

**Textbook**
Instructed during class

**Reference book, etc.**
Fay, Starr, Spencer, Johnson 「Worm Breeding for Dummies: A guide to genetic mapping in C. elegans」 (PDF textbook)

**Regarding studies out of class (preparation and review)**
Students will have to understand technical vocabulary in English. This may require studying outside of class hours.

**Others (office hour, etc.)**
Office hours will be 1 hour once per week, schedule to be announced on the first day of class.

This class involves some genetic experiments on nematodes.

lecture code: Z002018
Course title
ILAS Seminar-E2: Robots in Japanese Popular Culture

Affiliated department, Job title, Name
Graduate School of Engineering Professor, DANIELLE, Thomas

Group
Seminars in Liberal Arts and Sciences

Number of credits
2

Number of weekly time blocks
1

Class style
Seminar

Course offered year/period
2018 - First semester

Quota (Freshman)
10 (5)

Target year
Mainly 1st year students

Eligible students
For all majors

Day/period
Tue. 5

Classroom
Lecture room 5, Basement floor, Yoshida international house

Language
English

Keyword
robot / popular culture

Outline and Purpose of the Course
This seminar will look at the image of robots in Japanese popular culture, primarily focusing on the period from the Osaka Expo in 1970 until the present day. As well as manga, anime, cinema, and literature, we will look at the origins of Japan’s robot culture in karakuri ningyo; and contemporary manifestations such as Aibo and Nao. Conceptual issues such as the “uncanny valley” effect will also be discussed.

Course Goals
By the end of this course, students will have gained a broad understanding of the topic and learned how to make a critical response to the assigned readings.

Course Schedule and Contents
Topics to be covered include: robots in manga and anime; robot performances; robots as companions; androids and the “uncanny valley”; human-machine hybrids; cybernetic environments.

Class requirement
None

Method, Point of view, and Attainment levels of Evaluation
Grades will be determined by a combination of attendance, quality of presentation, and participation in discussions.

Textbook
Readings will be distributed in class.

Reference book, etc.
References
Christopher Bolton, Istvan Csicsery-Ronay Jr., and Takayuki Tatsumi, eds. 『Robot Ghosts and Wired Dreams: Japanese Science Fiction from Origins to Anime』 (Minneapolis: University of Minnesota, 2007)
Kisho Kurokawa 『Each One a Hero: The Philosophy of Symbiosis』 (Tokyo: Kodansha, 1997)

Office hours will be announced in class. For questions about the course or to arrange a meeting, email the instructor.

Reference book

Lecture code: Z002073
ILAS Seminar-E2: Introduction to Computation and Logic

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<td>For all majors</td>
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[Outline and Purpose of the Course]

Computers are a relatively recent invention, but they have drastically changed how modern humans live and think. However, few people really know what it means to "compute" something, or how we discovered the basic principles of computation. It turns out that the discovery of computation has its roots in the development of formal logic and a determination to find a rigorous foundations for mathematics about a century ago. In this course, we will introduce the students to formal logic and its relationship with computation. We will also introduce some of the main people involved with the various discoveries, and emphasize the historical background and motivations. The aim of the course is for students to not only gain a deeper understanding of computation, but also understand how it was discovered.

[Course Goals]

The students will become familiar with logical reasoning, formal proofs, and the theory of computability. They will also become familiar with the historical background and motivations that led to these developments.

[Course Schedule and Contents]

Below are some possible topics that we will cover during the course. The topics we cover will depend on the interests and abilities of the students.

1) Propositional logic
2) First-order Predicate logic (Frege)
3) First-order Arithmetic (Peano)
4) Set theory (Cantor)
5) Paradoxes, foundations & Hilbert's program (Russell, Hilbert)
6) Intuitionism & constructive mathematics (Brouwer)
7) Incompleteness theorem (Godel)
8) Lambda calculus, Church numerals, and arithmetic (Church)
9) Turing machines and Turing completeness (Turing)
10) Further topics (Curry-Howard correspondence)

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

Students are expected to actively participate in discussion, read material, and solve exercises in class. Evaluation will approximately be based on the following: class participation (30%), written and oral assignments (30%), final (40%).

[Textbook]

No textbook. Relevant materials will be distributed in class.

[Reference book, etc.]

The following books might be useful as references and background reading, but are not required. We will also look at some original papers, which will be handed out in class.

1) "Logic in Computer Science" by Michael Huth and Mark Ryan
2) "A profile of mathematical logic" by Howard Delong.
4) "Introduction to Mathematical Logic" by Elliott Mendelson.
   Publisher: Chapman and Hall (2015), ISBN: 978-1482237726
5) "Godel, Escher, Bach" by Douglas Hofstadter.
   Publisher: Basic Books (1999), ISBN: 978-0465026562

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

Students should review the course material after each class, and will have homework assignments.

[Lecture code: Z002002]
ILAS Seminar-E2: Wonders of Semiconductor (半導体のふしぎ)

Graduate School of Engineering
Senior Lecturer, DE ZOYSA, Menaka

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Outline and Purpose of the Course
The objective of this seminar is for students to learn about the basics of semiconductors, by investigating semiconductor devices such as solar cells, light emitting diodes (LEDs), laser diodes, transistors etc. Students will be asked for a short presentation about a semiconductor device. To familiarize students with semiconductors, experimental demonstrations will be carried out. In addition, students will be asked to join for laboratory tours, which help to understand the fabrication methods and characterizations of cutting-edge semiconductor devices.

Course Goals
- Understand the semiconductors.
- Familiarize with semiconductor devices with the help of experiments.
- Learn about the cutting-edge technologies of semiconductor devices.

Course Schedule and Contents
1. Overview of the course, introduction to semiconductors (5 weeks)
2. Solar cells: presentation and discussion (1 week)
3. LEDs: presentation and discussion (1 week)
4. Laboratory tour and experimental demonstrations (1 week)
5. Laser diodes: presentation and discussion (1 week)
6. Transistors: presentation and discussion (1 week)
7. Laboratory tour and experimental demonstrations (1 week)
8. Introduction of cutting-edge technologies (3 weeks)

Class requirement
None

Method, Point of view, and Attainment levels of Evaluation
Evaluation will be based on participation (40%), presentation (30%), and discussion (30%).

Textbook
Not used
ILAS Seminar-E2: Frontiers of Earthquake Science

Graduate School of Science
Associate Professor, ENESCU, Bogdan Dumitru

**Group**
Seminars in Liberal Arts and Sciences

**Number of credits**
2

**Number of weekly time blocks**
1

**Class style**
Seminar

**Course offered year/period**
2018 • First semester

**Quota (Freshman)**
15 (10)

**Target year**
Mainly 1st year students

**Eligible students**
For all majors

**Day/period**
Tue. 5

**Classroom**
Room 152, Faculty of Science Bldg. No.1 (North Campus)

**Language**
English

**Keyword**
Earthquakes (地震) / Tsunami (津波) / Disaster Prevention (防災)

---

**Outline and Purpose of the Course**

We are going to read scientific papers related to important/frontier topics of Earthquake Science. The purpose is to understand the key-message of the paper, rather than the detailed technical background. To facilitate understanding, some materials/vocabulary in Japanese will be provided during the seminar.

---

**Course Goals**

The student will become familiar with current important topics of Earthquake Science. The seminar also aims enabling the student to discuss earthquake related research topics in English.

---

**Course Schedule and Contents**

Each student is going to choose a paper in the field of Earthquake Science, and prepare a short report (a few PPT slides) summarizing the main ideas of the study. The paper can be chosen freely; some broad suggestions include:

- Megathrust earthquakes: physics and possibility of prediction;
- Tsunami: physics and early warning;
- Deep structure of the Earth 'illuminated' by seismic waves;
- Earthquake disaster prevention.

The first class will give students some broad options of topics/papers. During the second class we will decide the paper that each student is going to present. I will exemplify with a research presentation during the third class. Starting with the fourth class each student is going to present the chosen paper and will get feedback for improving his report. In the examination day, each student should present briefly his updated/revised report.

Depending on the number of students and available time, we could visit the underground seismic base isolation at the "Kyoto University Clock Tower", go to the nearby Hanaore Fault or visit the Disaster Prevention Research Institute (DPRI), Kyoto University (Uji Campus), to discuss with an earthquake scientist.

---

**Class requirement**

None

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

Grading will be based on attendance and participation (60%) and presentation of chosen paper (40%).

**Textbook**

Not used

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

The student will have to prepare the assigned paper.

**Others (office hour, etc.)**

Students can meet me during office hours with prior appointment.

Lecture code: Z002004
**Outline and Purpose of the Course**

Biotechnology is the combination of two words, Biology, and Technology. Therefore, biotechnology is the study of technological interventions that enhance the outputs of the biological systems. Biotechnology has been used for several centuries for various everyday processes, for example, brewing of beer, processing of waste etc. Animal biotechnology deals with biological techniques that are employed to improve genetic potential of animals for human health and welfare. This seminar will cover topics pertaining to reproductive biotechnology, genetic modification of animals, reproductive cloning, stem cell technology and ethical issues associated with it.

**Course Goals**

The purpose of the seminar is to provide practical information on various animal biotechniques, specifically pertaining to reproductive biotechnology, stem cell biology, and reproductive cloning.

**Course Schedule and Contents**

1. Introduction to and history of animal biotechnology
2. Embryo transfer technology
3. Artificial insemination
4. In-vitro fertilization
5. Intra-cytoplasmic sperm injection
6. Embryo/gamete biotechnology
7. Reproductive cloning and xenotransplantation
8. Cryobiology and its use in animal biotechnology
9. Embryonic stem cells and induced pluripotent stem cells (Two weeks)
10. Gene-knockout and genome editing technologies (Two weeks)
11. Transgenic technology and its applications
12. Bioethics
13. Feed Back (To be announced in the class)

**Class requirement**

None

**Method, Point of View, and Attainment Levels of Evaluation**

The students will be assessed based on assignments (2, 10 points each), presentation (1, 30 points), quizzes (4, 10 points each), and discussions (10 points) in the class.

**Textbook**

The students will be provided soft copy of the presentation via KULASIS or email. Other reading material will also be provided, if necessary.

**Related URL**

http://www.reprod.kais.kyoto-u.ac.jp/(Laboratory Home Page)

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

The students will be asked to prepare short talks, the topics for which will be given during the course. Presentations from previous lectures will be discussed.

**Others (office hour, etc.)**

By appointment (To be announced in the class).
## Course title
**ILAS Seminar-E2: Agri-Food Systems in Asia**

**Group**
Seminars in Liberal Arts and Sciences

**Number of credits**
2

**Number of weekly time blocks**
1

**Course offered year/period**
2018 • First semester

**Language**
English

**Target year**
Mainly 1st year students

**Classroom**
Seminar room 22, ILAS Bldg.

**Target students**
For all majors

**Day/period**
Tue. 5

**Class style**
Seminar

**Class requirement**
English proficiency suitable for understanding lectures, reading basic texts, and participating in class discussion.

**Method, Point of view, and Attainment levels of Evaluation**
- 20% Attendance and mini-essay assignments (*More than 4 absences without official excuse loses this grade*)
- 20% In-class discussion and participation
- 20% Final exam OR essay (student vote)
- 40% Final group presentation

**Textbook**
Not used
No textbook, but consultation of in-class materials and eBooks available at Kyoto University Library (see Reference book).

**Reference book, etc.**
- Van Esterik, Penny *Food Culture in Southeast Asia*.
- Greenwood ISBN:9780313344190 (eBook available from instructor)

**[Outline and Purpose of the Course]**
This course surveys the contemporary transformation of food, nutrition, and agriculture in East and Southeast Asia. The content of the course will be both familiar and challenging as we will cover the development of national cuisines, the role of farmers, and the evolution of diet in modern society. The perspective will be both practical (How does society gather and eat?) and theoretical (Why food systems developed the way they did).

**[Course Goals]**
Students will gain a foundation in ‘Food Studies’: how scientists understand and analyze global food trends from multiple perspectives. Students will also test their skills in an applied way by analyzing specific cuisines in East Asia and providing their own insight and analysis.

**[Course Schedule and Contents]**

1. **Introduction**
   1. The new worldwide passion for food
   2. Rice food systems of Southeast Asia
   3. Wheat food systems of East Asia
   4. Rice-based vs. Wheat-based civilizations

2. **Module 2: Food systems and cuisine**
   5. Rural food, urban cuisine
   6. Development of national cuisine
   7. Changing tastes and preferences of regional cuisine

3. **Module 3: Food skills and food knowledge**
   8. Food education and childhood
   9. Food and lifestyle
   10. Taste, smell, chew: sensory skills of eating

4. **Module 4: Student Presentations (order selected later)**
   11. Cuisine of Korea
   12. Cuisine of Vietnam
   13. Cuisine of Malaysia

**Lecture code:** Z002058
Course title: ILAS Seminar-E2 :How to Read a Scientific Paper

Affiliated department, Job title, Name
Graduate School of Biostudies
Professor, HEJNA, James

Group
Seminars in Liberal Arts and Sciences

Number of credits
2

Number of weekly time blocks
1

Class style
Seminar

Course offered year/period
2018 • First semester

Quote (Freshman)
6 (6)

Target year
Mainly 1st year students

Eligible students
For all majors

Day/period
Thu.5

Classroom
Seminar room B, Faculty of Medicine Bldg. G (Faculty of Medicine/Pharmaceutical Science Campus/University Hospital Campus)

Language
English

Keyword
English / Biology / Scientific literature / Analysis

[Outline and Purpose of the Course]
Scientific literacy is essential for a scientific career. More importantly, however, for a democracy to function, an educated electorate must be capable of discerning fact from hyperbole. In this class, we will examine a few influential papers in depth. This will introduce you to a basic approach to reading the primary scientific literature that will help you to reach your own conclusions about the data. Each student will pick one or two papers, and in class, together, we will try to understand everything about them—concepts, methods, analysis, interpretation, significance. This will be an opportunity to learn some science, as well as to see how experiments are designed. The class structure will depend on how many students enroll.

[Course Goals]
Students will acquire the ability to read scientific papers on their own, including how to track down additional information and how to look critically at data. Students will use their chosen papers as a springboard to explore subjects that are of particular interest to them, or subjects that are brand new.

[Course Schedule and Contents]
First Semester, Thursdays, 16:30-18:00PM

Optimally, each student will be able to choose 2 scientific papers to read in depth. During each class, we will spend a little time on each student's chosen paper, analyzing each paper over several weeks. If many students are enrolled, we may only have time for one paper from each student.

1. Types of Scientific Communication and Resources
2. Students find papers that interest them and bring them to class
3. Overviews of the papers, learning the background information
4. Analysis of the Abstract and Introduction (in-class discussion)
5. Understanding the Methods (in-class discussion)
6. Analysis of Figures and Results (in-class discussion)
7. Analysis of the Discussion (in-class discussion)
8. Analysis of style (in-class discussion)
9. Analysis of Paper #2 Abstract and Introduction (in-class discussion)
10. Analysis of Paper #2 Methods (in-class discussion)
11. Analysis of Paper #2 Figures and Results (in-class discussion)
12. Analysis of Paper #2 Discussion and style (in-class discussion)

13. Analysis of paper #2 Summaries of papers. Student written assignment due, and group discussion

This schedule is flexible, and will depend on how many students enroll in the course. The schedule also will depend on the types of papers that we are analyzing. For example, a paper with many results may require 2 weeks just to cover the results; we may also spend more time understanding particular methods, again depending on the papers that you will choose to read.

The class is open to all 1st and 2nd year students, although the papers will mainly come from the field of Biology (my expertise). Grading will be based on attendance, participation, and a take-home written assignment.

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Grading will be based on attendance (40 points), participation (40 points), and a take-home written assignment (20 points). The take-home written assignment will be graded on the basis of content and concepts rather than grammar.

[Textbook]
Not used

No textbook is required. I will provide background materials as the need arises. Often I help to explain methods or background information, and provide information from textbooks or review articles as needed. The class will be held in English, so an intermediate level of English or better would be helpful, since much of the background reading will be in English.

[Reference book, etc.]
I will provide additional background material as the need arises, depending on the topic of each paper that is chosen by students.

[Regarding studies out of class (preparation and review)]
Out of class reading may take 2-3 hours per week, to learn about the background for the papers that are discussed during class.

[Others (office hour, etc.)]
Office hours, Mondays, 10:00-12:00. I am often in my office, so you are free to drop in, and if I am there, I can usually find some time to discuss biology.

Lecture code: Z002019
**Course title**
ILAS Seminar-E2 : The Life and Work of Albert Einstein

**Affiliated department, Job title, Name**
Research Institute for Mathematical Sciences
Assistant Professor, Helmke, Stefan

**Group**
Seminars in Liberal Arts and Sciences

**Number of credits**
2

**Number of weekly time blocks**
1

**Class style**
Seminar

**Course offered year/period**
2018 • First semester

**Quota (Freshman)**
15 (15)

**Target year**
Mainly 1st year students

**Eligible students**
For all majors

**Day/period**
Tue. 5

**Classroom**
26, Yoshida-South Campus Bldg. No. 1

**Language**
English

**Keyword**
Non-euclidean geometry / curvature / relativity

**Outline and Purpose of the Course**
In spite of what the title of this seminar may suggest, its main objective is to study the developments of geometry during the 19th century, which culminated in Einstein's general theory of relativity in the early 20th century. At this early time, the only experimental fact confirming Einstein's theory was the abnormal orbit of mercury. Shortly after, the bending of light in the gravitational field of the sun was also confirmed. We will develop the geometric tools necessary to understand those phenomena and also gravitational waves, whose recent discovery received the Nobel price in physics of the year 2017.

**Course Goals**
The aim of this course is to understand the interaction between mathematics and the natural sciences and to engage in English discussions on a scientific topic.

**Course Schedule and Contents**
The exact contents of the seminar is flexible and may depend on special interests of the students. But the topics to be covered will be essentially as follows.

The first four weeks we will study Einstein's special theory of relativity and its historical background. This includes a brief introduction to multidimensional calculus, electrodynamics and the four dimensional Minkowski space.

The following five weeks will be devoted to the developments of differential geometry, beginning with the notion of curvature of a plane curve due to Huygens and Newton in the 17th century, followed by Euler's definition of principal curvatures of a surface embedded into space, Gauss's intrinsic geometry of a surface and finally Riemann's concept of a manifold and its curvature. Parallel, we will also study the idea of Non-Euclidean geometry which developed during the same period of time and which turned out to be related to the above and of some importance for Einstein later.

We will then just need two more weeks to understand the basic ideas of the general theory of relativity, i.e. the equivalence principle and Einstein's field equations.

The last three weeks we will study the following applications of the general theory of relativity: 1. The mercury orbit and bending of light, 2. Simple cosmological models and 3. Gravitational waves.

**Class requirement**
None

**Method, Point of view, and Attainment levels of Evaluation**
The evaluation is based on a presentation, which will be given during the class.

**Textbook**
Not used

**Reference book, etc.**
Introduced during class

**Regarding studies out of class [preparation and review]**
The students will be asked to prepare a short presentation.

**Others (office hour, etc.)**
No particular office hour, but students can make arrangements after the class or by email.

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Newton's fixed space
Einstein's flexible space-time

Einstein's flexible spacetime, from the film "Testing Einstein's Universe" by Norbert Bartel
Course title
ILAS Seminar-E2 :Project-based data analysis seminar

Affiliated department, Job title, Name
Graduate School of Medicine
Senior Lecturer, John BROWN

Group
Seminars in Liberal Arts and Sciences

Number of credits
2

Number of weekly time blocks
1

Class style
Seminar

Course offered year/period
2018 • First semester

Quota (Freshman)
10 (5)

Target year
Mainly 1st year students

Eligible students
For all majors

Day/period
Wed.5

Classroom
Seminar room 110, 1F, Faculty of Medicine Bldg. E (Faculty of Medicine/Pharmaceutical Science Campus/University Hospital Campus)

Language
English

Keyword
Data processing / Informatics / Data analysis / Scripting / Programming

[Outline and Purpose of the Course]
Students of all disciplines are encouraged to enroll.

Students will learn techniques in order to perform project-based analysis of large datasets related to their field of study.

Emphasis will be placed on creating structured and maintainable solutions to problems arising in their project, visualization of results, and coherent presentation of their project development.

Students can combine techniques from the course "Processing and analyzing data I" with new techniques to be learned in the seminar.

The prior course is recommend to be completed or taken in parallel, though is not a hard requirement.

[Course Goals]
Students will have successfully completed a data analysis project using data in their field of study or their hobby/interest.

Students will be able to present their project to the instructor and their peers, including a detail of their data analysis methods.

(Optional) Students who wish to pursue an advanced analysis of data and present their findings in an academic venue (for example, conference presentation or paper) will receive appropriate advisory support.

[Course Schedule and Contents]

(1) Review: shell scripting and basic data processing/filtering techniques.

(2–7) The Python programming language basics:
- Development environment, project organization and presentation: the Jupyter Notebook
- Data types: strings, lists, tuples, dictionaries, numbers
- Control structures: if/for/while
- Functions: Function definitions, function arguments
- Documentation: getting help, writing help
- Modules: importing, using, and creating
- Standard/common libraries: os, sys, logging, numpy, scipy, matplotlib

(Time-permitting: class design and Python-specific features)

(8–9) Basic statistics, statistical reasoning, and "responsible" analyses

(10)–(14) Individual student project development and analysis

(15) Student project presentations

(16) Feedback : Student survey of seminar

[Class requirement]
*Processing and analyzing data I* is STRONGLY RECOMMENDED to be completed before this seminar.

*Students with prior experience in computer science or programming may be considered for this course even if they have not completed "Processing and analyzing data I".

An appointment for discussion with the instructor is recommended.

[Method, Point of view, and Attainment levels of Evaluation]
Attendance and participation (35%), project quality (40%), final presentation (25%)

[Textbook]
Not used

[Reference book, etc.]
(introduced during class)

[Regarding studies out of class (preparation and review)]
Students will need to acquire datasets outside of class.

Students should review seminar contents for 2-6 hours per week, and be prepared to spend 3-6 hours per week analyzing their data and preparing to present their projects.

[Others (office hour, etc.)]
It is required that students have their own computer to participate in seminars and actively develop their projects.

Lecture code: Z002020
This is an introductory seminar on Japanese and European contract law. The course is organized into the following three parts:

1) Brief overview of the history and development of Japanese and European contract law,
2) Description of Japanese and European contract law,
3) Presentation of the efforts and steps towards a harmonized European contract law.

Along the way, relevant cases decided by Japanese courts and by the Court of Justice of the European Union will also be discussed.

The goal of this course is for students to acquire a basic knowledge of the structure and content of Japanese and European contract law, and learn about the similarities and differences between these laws. An additional goal is for students to get familiar with comparative law and its methods.

During this course, students will be given the opportunity to actively participate in discussions and exchange of ideas.

**Course Goals**

- Acquiring a basic knowledge of the structure and content of Japanese and European contract law.
- Learning about the similarities and differences between Japanese and European contract law.
- Getting familiar with comparative law and its methods.
- Improving presentation and communication skills in English.

**Course Schedule and Contents**

1. General introduction
2. Characteristics of contract law
3. History and development of Japanese contract law
4. History and development of European contract law
5. Formation of contracts and manifestation of intention
6. Interpretation and revision of contracts
7. Performance of contracts
8. Breach of contract
9. Realization of monetary claims
10. CISG
11. Consumer Sales Directive
12. Principles of European Contract Law and Draft Common Frame of Reference
13. Common European Sales Law
15. Conclusions

Feedback (the method will be explained later)

**Class requirement**

Students must be willing to talk in class, engage with other students and write a report paper in English.

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

No written examinations will be conducted.

- Class attendance and participation: 60%
- Oral presentation: 15%
- Submission of report paper: 25%

**Textbook**

Instructed during class

**Reference book, etc.**

Introduced during class

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

- Students are expected to review the content covered in the previous class.
- Students are also recommended to briefly preview the content of the next class. More detailed instructions will be provided in class.

**Others (office hour, etc.)**

Students will be required to actively participate and express their thoughts in English during the classes. Further, students will be assigned one oral presentation (of around 10 minutes, individual or in group, depending on the number of students) in part two or three. A paper of the presentation (around 2 pages sized A4 / around 800 words) shall be submitted at the end of the course.
### [Outline and Purpose of the Course]

This seminar is designed as an interactive introduction to socio-cultural anthropology and some of the main issues it addresses. The purpose of the course is to explore how culture shapes society, what an anthropological perspective is, and how it can contribute to our understanding of the world. We will explore some of the core themes and perspectives of the discipline using a variety of case studies.

### Course Goals

The objectives of this seminar are for students to:
- Gain an understanding of the different aspects and implications of culture, and the scope and significance of socio-cultural anthropology as a discipline
- Gain an understanding of its core topics
- Develop awareness of cultural diversity and our own preconceptions
- Become comfortable formulating ideas and opinions, and engaging in discussions on specific topics

### Course Schedule and Contents

This is a seminar-type class. Each session will rely on discussion and group work based on the week's topic and readings.

1. Orientation and overview
2. The objects and methods of anthropology
3. The notion of culture
4. Ethnocentrism and cultural relativity
5. Group work session
6. Language and communication
7. Pollution, taboo and otherness
8. Gift giving
9. Group work session
10. Cultural identities
11. Family and kinship
12. Rituals
13. Religion and magic
14. Final presentations

Note: this schedule may be subject to change. The detailed definitive schedule will be handed out during the first class.

### Class Requirement

There are no specific requirements for taking this seminar. However, students must be willing to prepare each session by completing the weekly readings and assigned tasks, and to participate actively in class.

### Method, Point of View, and Attainment Levels of Evaluation

Evaluation will be based on class attendance and active participation (60%), a group work discussion (20%), and final presentations (20%).

Active participation means actively engaging with the class content, participating in discussions and group work, and contributing to the class by sharing opinions, experiences and reflections. It also means taking notes and reviewing them each week.

Students absent 3 times or more will fail this class.

Tardiness (by 15 minutes or more) will be treated as absence. Systematic tardiness and/or unexplained early departures will greatly reduce your attendance and participation grade.

### Textbook

There is no textbook for this seminar. Weekly readings will be available for download. Printing and preparing the material is the responsibility of the student.

### Reference Book, etc.

**Reference book**

Introduced during class

### Regarding Study Out of Class (Preparation and Review)

Students should expect 2 to 3 hours of preparation outside the classroom to complete the weekly readings and assigned tasks.

### Others (Office hour, etc.)

- This is a seminar-type class, and as such will rely heavily on in-class discussion and student participation. It will be conducted in English. All readings and material will also be in English.
- As stated in the evaluation section, students are expected to engage actively during class. The level of engagement will greatly influence the final grade.
- Office hour is after class or by appointment.
Course title:
ILAS Seminar-E2 : Smart Materials (Innovations in Materials Chemistry)

Affiliated department:
Graduate School of Engineering

Job title:
Senior Lecturer

Name:
LANDENBERGER, Kira Beth

Group
Seminars in Liberal Arts and Sciences

Number of credits:
2

Number of weekly time blocks:
1

Course style:
Seminar

Course offered year/period:
2018 • First semester

Target year:
Mainly 1st year students

Eligible students:
For all majors

Day/period:
Thu. 5

Classroom:
26, Yoshida-South Campus Bldg. No. 1

Language:
English

Keyword:
stimuli responsive / self-healing / shape-memory / drug delivery systems / biomimetic

[Introduction and Purpose of the Course]
This course is intended to equip students with a basic understanding of what “smart materials” are and how these materials are present both in current research and the world around them. This course also aims to encourage students to be more creative in their own future studies and research. The course will focus on basic stimuli-sensitive materials in the beginning and then on actual systems in the second half of the class.

[Course Goals]
This course will provide students with a broad overview and introduction to “smart materials” as present in current research and current applications. The research topics will consider various “smart materials” including stimuli-responsive materials, drug delivery systems, self-healing materials, shape memory materials and various biomimetic systems. Students will be asked to engage in the course material more fully by preparing a semester project as well as completing occasional tasks outside of class throughout the semester.

[Course Schedule and Contents]
Introduction to Smart Materials
Thermoresponsive Materials
Light Responsive Materials
Magnetic Materials
Piezoelectric Materials
Ph and Electrically Responsive Materials
Research and Presentations Methods
Shape Memory Materials
Self-Healing Materials
Drug Delivery Systems
Biomimetic Materials (2 Seminars)
Smart Surfaces (2 Seminars)
Final Presentations

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Class attendance and participation (30%), homework (25%) and a semester presentation (45%).

[Textbook]
Not used

Handouts will be provided as necessary.

[Reference book, etc.]
Mel Schwartz 『Smart Materials』 (CRC Press) ISBN:9781420043723 (A useful resource for the course)
Xu Hou 『Design, Fabrication, Properties and Applications of Smart and Advanced Materials』 (CRC Press ISBN:9781498722483 (A useful resource for the course)

[Regarding studies out of class (preparation and review)]
Students will be asked to prepare a short oral presentation for the end of the semester. Additionally, to encourage students to engage with the course material throughout the semester, short assignments will occasionally be given.

[Others (office hour, etc.)]
Course title: ILAS Seminar-E2 :Introduction to Environmentally Friendly Chemistry

Affiliated department, Job title, Name
Graduate School of Engineering, Senior Lecturer, LANDENBERGER, Kira Beth

Group
Seminars in Liberal Arts and Sciences

Number of credits
2

Class style
Seminar

Course offered year/period
2018 • First semester

Quota (Freshman)
25 (15)

Target year
Mainly 1st year students

Eligible students
For all majors

Day/period
Wed.5

Classroom
26, Yoshida-South Campus Bldg. No. 1

Language
English

Keyword
solvent-free / biocatalysis / toxicity reduction / recycling / sustainable materials

[Outline and Purpose of the Course]
This course introduces the concept of environmentally friendly chemistry both in the chemistry lab as well as in daily life in the world around us. The course will consider current practices in chemistry, advances in environmentally friendly chemistry and areas for future change. This course aims to familiarize students with practical principles for environmentally friendly chemistry that can be applied in future research or work.

[Course Goals]
Students will learn about the basics of environmentally friendly chemistry and how to apply it. This includes a discussion of toxic materials and how to reduce their use, the use of other solvents or reduction of current solvents, the effective use of biocatalysts, as well as methods to make the chemistry cleaner and safer in the production of everything from food to paper to household furniture. To engage in the course material more fully, students will prepare a semester project as well as completing occasional tasks outside of class.

[Course Schedule and Contents]
Introduction to Environmentally Friendly Chemistry
The Chlorine Controversy (2 Seminars)
Toxic Heavy Metal Ions
Solid Catalyst and Reagents for Ease of Workup
Research and Presentations Methods
Chemical Separations
Working Without Organic Solvents
Biocatalysis and Biodiversity
Stereochemistry
Agrochemicals
Chemistry of Longer Wear
Chemistry of Recycling
Materials for a Sustainable Economy
Final Presentations

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Class participation and attendance (30%), homework (25%), semester presentation (45%)

[Textbook]
Not used
Handouts will provided as needed.

[Reference book, etc.]
(Recommended but not required.)

[Regarding studies out of class (preparation and review)]
Students will be asked to prepare a short oral presentation for the end of the semester. To engage more fully with the class material throughout the semester, students will also occasionally be asked to complete homework.

[Others (office hour, etc.)]
Outline and Purpose of the Course

Our Universe is far beyond what our eyes can perceive. Hidden in the tranquil ocean of stars, nebulae and galaxies pictured by optical telescopes and cameras around the world everyday, extreme energetic phenomena that can only be observed through ‘invisible lights’ (e.g., radio waves, X-rays, gamma-rays) or even messengers other than electromagnetic waves (e.g., cosmic-rays, neutrinos) are happening frequently here and there in the Cosmos. This seminar will bring students into this exciting world of the Invisible Universe.

Course Goals

1) To obtain basic knowledge and feel the excitement of forefront astronomy and astrophysics beyond optical telescopes.

2) To briefly experience the everyday life of an astrophysicist nowadays through the process of guided independent research, report writing and oral presentation.

Course Schedule and Contents

In this seminar, besides a few introductory lectures on topics surrounding multi-wavelength astronomy, the students will perform guided but independent research on intriguing astrophysical objects of their choices.

This seminar will be in a casual format and conducted mainly in English (with occasional Japanese when necessary). Students are encouraged to ask questions and discuss on topics with their peers and instructor spontaneously at each meeting.

Students will present their studies and findings through a written report and an oral talk during a seminar meeting.

Oral presentations will be scheduled flexibly between the instructor and the students in class.

Class Requirement

None

Method, Point of View, and Attainment levels of Evaluation

Final grades will be assessed according to:
1) in-class participation (40%)
2) one written report (30%)
3) one oral presentation (30%)

Textbook

Not used

Reference book, etc.

Introduced during class

Regarding studies out of class (preparation and review)

Independent research. Guidance will be given in a seminar meeting.

Others (office hour, etc.)

No fixed office hour will be scheduled. Students can make appointment with the instructor in-person if necessary, or simply contact by Emails.
<table>
<thead>
<tr>
<th>Course title &lt;English&gt;</th>
<th>ILAS Seminar-E2 : Introduction to Human Genetics and Genetic Disease  （人類遺伝学と遺伝病入門）</th>
</tr>
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<tbody>
<tr>
<td>Affiliated department, Job title, Name</td>
<td>Graduate School of Medicine, Senior Lecturer, Marco Marques Candeias</td>
</tr>
<tr>
<td>Number of credits</td>
<td>2</td>
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<td>Number of weekly time blocks</td>
<td>1</td>
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<td>Class style</td>
<td>Seminar</td>
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<td>Course offered year/period</td>
<td>2018 • First semester</td>
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<td>Quota (Freshman)</td>
<td>15 (15)</td>
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<td>Eligible students</td>
<td>For all majors</td>
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<td>Day/period</td>
<td>Wed. 5</td>
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<tr>
<td>Classroom</td>
<td>RC, Yoshida-South Campus Academic Center Bldg. North Wing</td>
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<td>Language</td>
<td>English</td>
</tr>
<tr>
<td>Keyword</td>
<td>Human Genetics / Genetic Disorders / Cancer Genetics / Clinical Research / Health Care</td>
</tr>
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</table>

[Outline and Purpose of the Course]
An overview of human genetic disorders and how current research is impacting their clinical management. Topics include: single gene disorders, multifactorial disorders; cancer genetics; identification and analysis of human disease genes. Students will learn from recent research articles as well as from a recent text book on human genetics. After learning about the several subjects, the students will present recent research in class and active discussion will be encouraged.

[Course Goals]
The classes will be interactive. The students will learn from the instructor as well as from each other. Recent exciting research discoveries about human genetics and genetic disease will be introduced and discussed. The students will learn about gene structure and function, mutations and diversity, inheritance, detection and treatment.

[Course Schedule and Contents]
The following topics will be viewed during a total of 14 classes:
1. The Human Genome: Gene Structure and Function
2. Human Genetic Diversity: Mutation and Polymorphism
3. The Chromosomal and Genomic Basis of Disease: Disorders of the Autosomes and Sex Chromosomes
4. Single-Gene Inheritance
5. Complex Inheritance of Common Multifactorial Disorders
6. Genetic Variation in Populations
7. Identifying the Genetic Basis for Human Disease
8. The Molecular, Biochemical, and Cellular Basis of Genetic Disease
9. The Treatment of Genetic Disease
10. Developmental Genetics and Birth Defects
11. Cancer Genetics and Genomics
12. Personalized Health Care

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on active participation (20 %), assignments (50 %) and quizzes (30 %). Those who are absent more than four times will not be credited.

[Textbook]
Robert L. Nussbaum, Roderick R. McInnes, Huntington F Willard  "Thompson & Thompson Genetics in Medicine" (Elsevier Health Sciences) ISBN: 0323392067, 9780323392068

[Regarding studies out of class (preparation and review)]
A few hours will be necessary weekly to prepare for the class. Handouts will be available in advance to help with the preparation. During the assignment weeks extra hours will be necessary in order to prepare for the presentation in class.

[Others (office hour, etc.)]
Questions and discussions during class are highly encouraged. Questions and discussions will also be happily addressed any other time, even outside the official office hour (Thursdays 12:00-13:00).
Course title: ILAS Seminar-E2: Introduction to Stem and iPSC Cells

ILAS Seminar-E2: Introduction to Stem and iPSC Cells

Graduate School of Medicine
Senior Lecturer, Marco, Marques Candeias

<table>
<thead>
<tr>
<th>Group</th>
<th>Seminars in Liberal Arts and Sciences</th>
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<tr>
<td>Language</td>
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| Keyword | Stem Cell / iPSC Cell |

[Outline and Purpose of the Course]

How a single egg-cell can give rise to a tridimensional complex system of tissues and organs in the organism. Fundamentals of Embryology (from the oocyte until gastrulation/neurulation) and Stem Cell Biology (from ES to IPS) will be introduced. Students will learn from recent research articles (including the original Takahashi & Yamanaka paper) as well as from recent textbooks on Developmental Biology and Stem Cell Research. After learning about the several subjects, the students will present recent research in class and active discussion will be encouraged.

[Course Goals]
The classes will be interactive. The students will learn from the instructor as well as from each other. Recent exciting research discoveries about IPS cells and cell replacement therapy will be introduced and discussed. The students will learn about stem cells, cell commitment and differentiation, IPS cells and personalized cellular therapy.

[Course Schedule and Contents]
The following topics will be viewed during a total of 14 classes:
- Differential Gene Expression
- Fertilization: Beginning a New Organism
- Early Development in Mammals
- Embryonic Stem Cells
- Differentiation in Early Development
- Generation of Induced Pluripotent Stem (iPS) Cells
- Characteristics and Characterization of Pluripotent Stem Cells
- Cancer Stem Cells
- Neural Stem Cells: Therapeutic Applications in Neurodegenerative Diseases
- Use of Embryonic Stem Cells to Treat Heart Disease
- Insulin-Producing Cells Derived from Stem Cells: A Potential Treatment for Diabetes
- Stem Cells for the Treatment of Muscular Dystrophy
- Cell Therapy for Liver Disease
- Skin Regeneration
- Embryonic Stem Cells in Tissue Engineering
- Adult Stem Cells in Tissue Engineering
- Stem Cell Gene Therapy
- Ecological Developmental Biology: Biotic, Abiotic, and Symbiotic Regulation of Development
- Developmental Mechanisms of Evolutionary Change

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on active participation (20 %), assignments (50 %) and a final examination (30 %). Those who are absent more than four times will not be credited.

[Textbook]

[Regarding studies out of class (preparation and review)]
A few hours will be necessary weekly to prepare for the class. Handouts will be available in advance to help with the preparation. During the assignment week extra hours will be necessary in order to prepare for the presentation in class.

[Others (office hour, etc.)]
Questions and discussions during class are highly encouraged. Questions and discussions will also be happily addressed any other time, even outside the official office hour (Thursdays 12:00-13:00).
ILAS Seminar-E2 : Logic, critical thinking and argument (Natural Sciences and Engineering)

Affiliated department, Job title, Name
Graduate School of Energy Science
Associate Professor, MCLELLAN, Benjamin

Course title
<English>
ILAS Seminar-E2 : Logic, critical thinking and argument

Group
Seminars in Liberal Arts and Sciences

Number of credits
2

Number of weekly time blocks
1

Class style
Seminar

Course offered year/period
2018 • First semester

Quota (Freshman)
10 (7)

Target year
Mainly 1st year students

Eligible students
For all majors

Day/period
Thu.5

Classroom
23, Yoshida-South Campus Bldg. No. 1

Language
English

Keyword
logic / critical thinking / writing / reading / argumentation

[Outline and Purpose of the Course]
The aim of this course is for students to learn and practice of critical thinking. The students will participate in extracting themes, understanding bias in documents and in their own work. They will practice how to critically analyse documents and to develop their own writing skills, particularly in the area of justification of arguments and the logical structuring and linking of content.

[Course Goals]
The goal of the course is for students to be able to present logical written arguments and to be able to critically assess the validity and structure of literature in the natural sciences.

[Course Schedule and Contents]
The course will broadly cover critical thinking, including the following themes:
1. Introduction to critical thinking: what, why and how
2. Proof, argument and opinion
3. Logic and illogicality
4. Exercise on weeks 2-3
5. Making the most of information (but not too much)
6. Academic argument in natural science writing
7. Exercise on weeks 5-6
8. Assumptions, reliability and uncommon sense
9. Exercise on week 8
10. Structuring and clarity in writing
11. Exercise on week 10
12. Comprehension, comprehensiveness and conciseness
13. Exercise on week 12
14. Summarising the course

Lecture code: Z002021

Class requirement
Students should be taking at least one subject in English in the year they take this subject, or have done so in a previous year.

Method, Point of view, and Attainment levels of Evaluation
Five class exercises (5 x 10%) = 50%
Final take-home exam (50%)
Students will be marked on the ability to identify and critically analyse text, and to produce text of their own.
Standard marking framework is used with a raw score given (0-100)

Textbook
Merrilee H. Salmon 「Introduction to Logic and Critical Thinking (6th Edition)」（2012）

Reference book, etc.
Judith Boss 「THiNK (2nd Edition)」（2011）

Regarding studies out of class (preparation and review)
Out of class preparation for in-class exercises will be essential.

Others (office hour, etc.)
For this class, office hours are Monday and Wednesday 13:00-14:00 but prior email contact is required.
Course title: ILAS Seminar-E2: Introduction to Engineering in Biology and Medicine

Affiliated department, Job title, Name: Institute for Frontier Life and Medical Sciences, Senior Lecturer, OKEYO, Kennedy Omondi

Group: Seminars in Liberal Arts and Sciences
Number of credits: 2
Number of weekly time blocks: 1

Class style: Seminar
Course offered year/period: 2018 • First semester
Quota (Freshman): 20 (10)

Target year: Mainly 1st year students
Eligible students: For all majors
Day/period: Mon.5

Classroom: Seminar room 21, ILAS Bldg.

Keyword: Biomedical engineering / Microengineering / Micro/Nano systems / Biomanipulation

[Outline and Purpose of the Course]
With increasing integration of science and engineering, more and more focus is being placed on multidisciplinary research. Against this background, this seminar will aim at introducing students, in particular first year students, to ongoing engineering approaches aimed at understanding and/or solving biological and clinical problems. Discussions will be centered on (biological/clinical) problem identification, hypothesis setting around the problem, discussions on potential engineering solutions and, as may be necessary, experimental verification of the discussed solution.

[Course Goals]
It is intended that the course will help students develop interest in the development and application of engineering concepts and methods to biology, medicine and health sciences to provide effective solutions to biological, medical and healthcare problems, an important aspect in their growth to becoming next generation leaders.

[Course Schedule and Contents]
This seminar will tackle different selected topics related to application of engineering principles and knowledge to solving clinical problems or elucidating known and unknown biological phenomena. Although the topics listed below are wide and varied, discussions will be consistent with the main focus of problem setting and identifying the most appropriate solution to the set problem.

1) Engineering in biology at the micro and nano scale and their clinical applications (3 weeks)
We will discuss the convergence of biology with micro/nano technology that have enabled the manipulation, analysis and detailed study of living systems including single cells, DNA molecules and other biological materials. Engineering principles behind micro/nano technology will be highlighted and potential clinical applications discussed.

2) Introduction to point-of-care diagnostics (3 weeks)
Provision of medical care at the bedside of a patient or at home (at the comfort of a patient) is increasingly becoming important in the face of a rapidly aging society. Here we will identify and discuss emerging technologies such as microfluidics/wearable clinical devices that are enabling the realization of point-of-care or personalized medicine.

3) Introduction to emerging trends in engineering artificial organs/tissues (3 weeks)
Fusion of engineering and biology has made it possible to realize constructs of organs or tissues which mimic the functions of native organs/tissues.

4) Biochips and their applications (3 weeks)
Biochips are products of micro/nano fabrication which have increasingly found application in cell, DNA and protein analyses for disease diagnosis and drug screening. In this seminar, we will look at specific examples of biochips based on specific application areas such as cell manipulation and DNA analysis.

5) Discussions on the future role of engineering in biology and medicine (3-4 weeks)
We will discuss the importance of multidisciplinary research and highlight emerging technologies such as brainchips, wearable diagnostic devices that are promising to revolutionize traditional medicine, drug discovery, cancer research and personal disease management. On a rotational basis, students will each pick a topic of interest for discussion and presentation. Grading will be based on how well a topic is researched, presented and discussed.

[Class requirement]
None in particular. The seminar will be discussion-based, so prior preparation by way of reading about the above topics will be helpful in making the discussions lively.

[Method, Point of view, and Attainment levels of Evaluation]
Class Presence / Participation 10%, Homework 15%, Midterm Report 25%, Final Report 35%, Final Presentation: 15%

[Textbook]
Handouts

[Reference book, etc.]

[Regarding studies out of class (preparation and review)]
Prior reading of scientific papers on topics to be discussed is recommended to enhance understanding.

[Others (office hour, etc.)]
To be announced during class. However, questions, suggestions and comments can be posted by email anytime.

http://www.shmoop.com/biotechnology/

Lecture code: Z002048
### Outline and Purpose of the Course

This course introduces the basics of computer-based 3D modeling (shape design, lighting, materials, surface textures), animation (keyframes, object motion, camera zooming and panning, etc.) and gaming (interactive 3D worlds). Assignments include: (1) 3D bar and pie chart construction, (2) room visualization, (3) human-like character animation, and (4) multiple-choice experimental game design. The open-source software “Blender” will be used for all lessons. Programming experience is recommended but not required.

### Course Goals

Students will become familiar with the main concepts of 3D modeling and animation. They will learn how to reproduce example 3D models, animations and simple games. Last, as a final project they will work to produce their own 3D model / animation / game from start-to-finish.

### Course Schedule and Contents

Over this 14-week lecture the following topics will be covered in each class:

1. Introduction: 3D Modeling & Blender
2. 3D Modeling I: Creating Shapes
3. 3D Modeling II: Materials & Lighting
4. 3D Modeling III: Advanced Modeling Tools
5. Character Modeling I: Eyes
6. Character Modeling II: Face
7. Character Modeling III: Body
8. Rigging I: Armatures
9. Rigging II: Skinning
10. Animation I: Basics
11. Animation II: Editing
12. Fine-tuning I: Camera & Lighting
13. Fine-tuning II: Compositing
14. Final Projects I: Interactive Work Day
15. Final Project II: Presentations and Discussions

### Class requirement

None.

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

Students are expected to actively participate in class, to reproduce all examples discussed in class, and also to produce 3D models independently. Evaluation will be based on the following criteria: class participation (20%), assignments (60%; four assignments @ 15% each), final project (20%).

### Textbook

Oliver Villar 『Learning Blender: A Hands-On Guide to Creating 3D Animated Characters』 (Addison-Wesley Professional) ISBN:978-0134663463 (This lecture will loosely follow this textbook. This textbook is OPTIONAL, but may be useful for reviewing concepts, and for self-study of advanced topics.)

### Related URL

www.blender.org (Blender: open-source 3D modeling software.)

### Regarding studies out of class (preparation and review)

There will be a small assignment each week based on lecture content; students should submit these assignments more than one day before the next lecture. Additionally there will be a final project that students are expected to complete outside of class.

### Others (office hour, etc.)
Course title: "ILAS Seminar-E2: The wonderful world of quantum physics"

Affiliated department, Job title, Name: Graduate School of Science, Senior Lecturer, PETERS, Robert

Group: Seminars in Liberal Arts and Sciences

Number of credits: 2

Number of weekly time blocks: 1

Class style: Seminar

Course offered year/period: 2018, First semester

Target year: Mainly 1st year students

Eligible students: For all majors

Day/period: Mon. 5

Classroom: 21, Yoshida-South Campus Bldg. No. 1

Language: English

Keyword: quantum mechanics / particles and wave / quantum phenomena / superconductivity

[Outline and Purpose of the Course]
We will start with an introduction to crucial experiments 100 years ago, which have changed the beliefs of the physicists about small particles and atoms. From there, we will understand the differences between macroscopic and microscopic world and the basic concepts of modern quantum theory. In the second part of the course, we will look at quantum phenomena and applications of them such as quantum teleportation, quantum computing, entanglement, magnetism, and superconductivity.

[Course Goals]
- Catching a glimpse of the bizarre behavior of the quantum world.
- Seeing the differences between macroscopic and microscopic world
- Becoming familiar with the basic concepts of quantum physics
- Revealing the mysteries behind quantum phenomena such as magnetism, superconductivity, and entanglement.

[Course Schedule and Contents]
The course will be adapted to the level of the students. Therefore, the number of weeks may change.

Introduction to experiments on atoms and quantum-particles which have changed the beliefs of physicists 100 years ago (4-6 weeks)
- light as wave and particle
- electrons as waves
- double slit experiment for electrons
- the development of modern quantum mechanics
- Heisenberg uncertainty-principle
- why quantum mechanics is weird

Applications of quantum phenomena (3-4 weeks)
- quantum tunneling
- quantum teleportation
- quantum computing

Quantum phenomena in atoms, molecules, larger bodies (5-7 weeks)
- atoms
- molecules
- superconductivity
- magnetism

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Attendance, participation (50%) and assignment (50%)

[Textbook]
Not used

[Reference book, etc.]
(Reference book)
Introduced during class

[Regarding studies out of class (preparation and review)]
The students will be asked to prepare short talks, which will be given during the course.

[Others (office hour, etc.)]
Office hour: After the course

Lecture code: Z002003
ILAS Seminar-E2 : An introduction to programming for engineers

**Affiliated department, Job title, Name**
Graduate School of Engineering, Senior Lecturer, PHILAMORE, Hemma

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<tr>
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<td>Yoshida-South Campus Academic Center Bldg.</td>
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**Keyword**
Programming / Python

### [Outline and Purpose of the Course]

The Python language is rapidly growing in popularity both for commercial and academic use. It’s accessibility as an open-source, high level language and its wide applicability make it a valuable tool for students who are completely new to programming as well as those with some prior programming experience, looking to broaden their skills portfolio. Examples and exercises will be based on engineering-related problems, of the type that students are likely to encounter in other subjects on the engineering curriculum for example mathematical modelling and processing data e.g. experiment results.

Part 1, Fundamentals of Programming will cover core programming skills and Python functionality. Students will also learn how to write tests to prove that their code works under different conditions.

Part 2, Applications of programming will apply the skills learnt in Part 1 to writing programs to solve engineering related problems. This will include development of an individual project as coursework.

Version control to document and share your code will be taught throughout.

### [Course Goals]

- To obtain a basic programming knowledge.
- To develop skills in programming that can be applied to enhance students’ learning in other engineering subjects.
- To be able to independently develop an individual programming project.

### [Course Schedule and Contents]

The provisional schedule for the course is as follows. However, the order, time allocated to section 1 and 2 and the individual themes within each section is subject to change depending on the class size and students’ background understanding, progress and proficiency for the subject matter. Students will be notified of changes to the schedule in advance to give adequate time to prepare for forthcoming seminars.

**Part 1: Fundamentals of Programming**
1. Course introduction (1 week).
2. Introduction to version control (1 week).
3. Data types and operators (1 week).
4. Control Flow (1 week).
5. Data structures (1 week).
6. Functions (1 week).
7. Library Functions (1 week).
8. Arrays and numerical computation (1 week).
9. Plotting (1 week).
10. Input and output (1 week).
11. Error handling and testing I (1 week)

**Part 2: Applications of Programming**
1. Error handling and testing II (1 week)
2. Coursework project: Solving engineering problems in code (2 weeks)

Exam (1 week)
Feedback session (1 week).

### [Class requirements]

Computers will be provided however it is advisable for students to bring their own laptops to use in class where possible.

If using personal laptops, either for classwork or homework, students should download and install two pieces of software before starting the course:
- Git
- Anaconda (please select Python 3.6 version)

Both are free and easy installation instructions can be found here:

Windows
https://www.atlassian.com/git/tutorials/install-git#windows
https://docs.anaconda.com/anaconda/install/windows

Mac
https://www.atlassian.com/git/tutorials/install-git#mac-os-x
https://docs.anaconda.com/anaconda/install/mac-os

Linux
https://www.atlassian.com/git/tutorials/install-git#linux
https://docs.anaconda.com/anaconda/install/linux

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

Coursework project (50%): Weeks 13 and 14 (In-class activity. Work not finished in allocated class time should be finished for homework)
Exam (50%): Week 15

### [Textbook]

Instructed during class

### [Reference book, etc.]

(Reference book)
Introduced during class
The textbook is provided online and can be found here: https://github.com/hphilamore/ILAS_python

[Regarding studies out of class (preparation and review)]
More detailed instructions will be provided in class.

[Others (office hour, etc.)]
ILAS Seminar-E2: An introduction to programming for everyone

Outline and Purpose of the Course

The Python language is rapidly growing in popularity both for commercial and academic use. Its accessibility as an open-source, high level language and its wide applicability make it a valuable tool for students who are completely new to programming as well as those with some prior programming experience, looking to broaden their skills portfolio. This course will cover the fundamentals of programming through graphics and game-development examples designed to teach programming in a way that is approachable to students from broad-ranging majors. The later part of the course will give an introduction to networks and socket programming through multi-player games.

Part 1, Fundamentals of Programming will cover core programming skills and Python functionality with visual examples. Students will consolidate skills learnt in this section through development of an individual project as coursework.

Part 2, Applications of Programming will apply the skills learnt in Part 1 to developing simple games and animations including multi-player games.

Class requirement

Computers will be provided however it is advisable for students to bring their own laptops to use in class.

If using personal laptops, either for classwork or homework, students should download and install two pieces of software before starting the course:

- Git
- Anaconda (please select Python 3.6 version)

Both are free and easy installation instructions can be found here:

Windows https://www.atlassian.com/git/tutorials/install-git#windows
https://docs.anaconda.com/anaconda/install/windows

Mac
https://www.atlassian.com/git/tutorials/install-git#mac-os-x
https://docs.anaconda.com/anaconda/install/mac-os

Linux
https://www.atlassian.com/git/tutorials/install-git#linux
https://docs.anaconda.com/anaconda/install/linux

Method, Point of view, and Attainment levels of Evaluation

Coursework project (50%): Weeks 13 and 14 (In-class activity. Work not finished in allocated class time should be finished for homework)

Exam (50%): Week 15

Textbook

Instructed during class
| [Reference book, etc.]
| ---
| (Reference book)  
| Introduced during class  
| [Regarding studies out of class (preparation and review)]  
| More detailed instructions will be provided in class.  
| [Others (office hour, etc.)]  

In this course, we will explore major ethical issues in health sciences and will introduce institutional positions and debate various topics based on relevant case studies. Classical themes such as end of life care, euthanasia and animal/human research as well as emerging topics such as stem cell research and genetically modified organisms will be covered.

The purpose of this course is to enable the students to think clearly and carefully through their own positions on important ethical issues in healthcare. Students will be taught to craft well-argued, well-written papers and express their own views clearly in class discussions and engage the views of their classmates.

[Course Goals]
1. To achieve familiarity with some basic ethical frameworks
2. To identify, analyze and summarize ethical issues
3. Clearly and carefully develop own positions on important ethical issues
4. Express your own views clearly in class discussion and engage the position of others

[Course Schedule and Contents]
In principle, the course will be offered along the following plan. However, order or the number of times for each theme may change depending on the progression of the course or handling on current topics.

1. Ethical reasoning
2. Principles and theories of bioethics
3. Request to die: Doctor-assisted suicide
4. Abortion
5. Assisted reproduction
6. Seriously ill infants
7. Ethical issues in testing for genetic diseases
8. Ethical issues in transplantation
9. Medical research on animals
10. Clinical Research
11. & 12. Embryos, stem cells and cloning
13. Genetically modified plants and dietary futures
14. Healthcare policy-Right to health care
15. Medical ethics
16. Genetic modification
17. Stem cell research
18. End of life care
19. Doctor-assisted suicide
20. Abortion
21. Assisted reproduction
22. Stem cell research
23. Ethical issues in research
24. Medical ethics
25. Genetic modification
26. Stem cell research
27. End of life care
28. Doctor-assisted suicide

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Classroom participation and discussion 50%
Evaluating a case study 50%

[Textbook]
Not used

[Reference book, etc.]
Reference materials will be provided during the class.

[Regarding studies out of class (preparation and review)]
1. Students are expected to come to class having completed the assigned reading and writing, and ready to contribute to discussions.
2. Students are required to write a report on one of the cases covered in class for which they will do additional research on their own.

[Others (office hour, etc.)]
Please contact the instructor by email if you have any questions. The instructor will also be available for course-related consultation out of seminar hours is requested by the students. Please make an appointment by email (hpoudyal@kuhp.kyoto-u.ac.jp).

Parts of this course will be complimentary to 臨床コミュニケーション (医・英) -E3 (Clinical Communication (Medicine,English)-E3 course).
ILAS Seminar-E2: First Step to Qualitative Research Methods - Field Surveys and Data Analysis

**Affiliated department, Job title, Name**
Disaster Prevention Research Institute Associate Professor, SAMADDAR, Subhajyoti

**Group**
Seminars in Liberal Arts and Sciences

**Number of credits**
2

**Number of weekly time blocks**
1

**Course style**
Seminar

**Course offered year/period**
2018 • First semester

**Quota (Freshman)**
25 (15)

**Target year**
Mainly 1st year students

**Eligible students**
For all majors

**Day/period**
Wed.5

**Classroom**
Seminar room 21, ILAS Bldg.

**Language**
English

**Keyword**
Research Methodology / Qualitative research / Survey tools and techniques

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**Outline and Purpose of the Course**
This course will offer to learn a basic practical knowledge on qualitative research methods by conducting practical exercises, field surveys and analyzing field data. Emphasis will be placed on equipping students to gain the practical skills necessary to conduct a small field work project using action-oriented methods. Some of the methods taught will include qualitative research design, participant observation, interviews, focus groups and collaborative narrative inquiry.

**Course Goals**
To conduct some practical exercises and field surveys to get a basic idea on qualitative research methods. To study and work together to understand how qualitative data can be analyzed and used for empirical research study.

**Course Schedule and Contents**
1. Introduction to Qualitative Research (Week 1)
   - Fundamentals of qualitative research
   - The significance of qualities research
   - Difference between qualitative and quantitative research methods.
2. Major Qualitative Research methods and approaches (Week 2)
   - Phenomenology; Grounded Theory; Ethnography.
3. Field Works and data collection (Week 3 to 9)
   - Sampling; Case-study; Observation; Photography; Content Analysis; Group Discussion; Interview
4. Data Analysis and Interpretation (Week 10 to 14)
   - Coding procedures; Case Analysis; Cross-Case comparison

---

**Class requirement**
None

**[Method, Point of view, and Attainment levels of Evaluation]**
Evaluation will be based on active participation (10 points), Assignment (40 Points) and final presentation (50 points). Assignments and report presentations will be assessed on the basis of achievement level for course goals.

**[Textbook]**
Handouts will be distributed by the instructor if necessary.

**[Regarding studies out of class (preparation and review)]**
Site appraisal and practical will be conducted.

**[Others (office hour, etc.)]**
The course with experiments or offered outside of the campus, state on the taking out accident insurance of Personal Accident Insurance for Students Pursuing Ed. & Rsch. as needed.
There are approximately 800,000 dams in operation and more than 10,000 dams are planned or under development on at least 60% of the world’s rivers. While dams can provide stored water for generation of electricity, irrigation, recreation, as well as domestic and industrial water supply, inadequate designed and implemented dams have drastic damaging effects on the environment and people. Water discharge downstream reduced, water quality declines, fish populations suffer and people’s livelihoods are put at risk.

This seminar course introduces students to the basic principles of dam design, types, and focuses on the main uses of dams and reservoirs. Despite their controversy, dams and reservoirs are very important in many disciplines that serve a number of different functions but one of the largest is to supply water. This beginning course provides important background for all sciences and engineering disciplines and bridging the mechanics of fluids in our everyday lives. We seek to excel/apply dam and reservoir to diverse areas of social, environment, human health, and engineering. During lectures videos of real dams and reservoirs and actual problems will be discussed, to improve students understanding of real life problems. Finally, a presentation will be required to demonstrate the learned principles applied in the student's majors.

Course Goals:

- At the end of this course, the student will be able to understand:
  - the different types and classifications of dams and reservoirs;
  - the comprehensive sediment management techniques;
  - the negative impacts and mitigation measures for dam construction;
  - The importance of dams and how to upgrade

Course Schedule and Contents:

- Week 1: Introduction- Main Functions of Dams and Reservoirs
- Week 2: Introduction- Classification and different types of dams
- Week 3: What is a Reservoir? Definition, Types of Reservoirs and Construction
- Week 4: Reservoir Capacity and Reservoir Sedimentation
- Week 5: Dam Field Trip
- Weeks 6-8: Basic and Principles of Dams: Feasibility Study, Planning, Construction and Design
- Week 9: Reports and Presentations
- Weeks 10-12: Sustainable Management of Reservoir: Sediment Management Techniques
- Week 13: Advanced Technologies to Upgrade Dams
- Week 14: Reports and Presentations
- Week 15: Final Report
### Course title
ILAS Seminar-E2 : Global Health

### Affiliated department, Job title, Name
Graduate School of Medicine
Senior Lecturer, S. Pilar Suguimoto

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<th>Target year</th>
<th>Eligible students</th>
<th>Day/period</th>
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<td>For all majors</td>
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<tr>
<th>Classroom</th>
<th>Language</th>
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<tbody>
<tr>
<td>Small seminar room, 1F, Science Frontier Laboratory, Faculty of Medicine (Faculty of Medicine/Pharmaceutical Science Campus/University Hospital Campus)</td>
<td>English</td>
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<table>
<thead>
<tr>
<th>Keyword</th>
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<tbody>
<tr>
<td>Global Health / Disease burden / Public Health / International Health</td>
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</table>

### [Outline and Purpose of the Course]
Why should we care about the health of other people, especially that of people in other countries? Global health is not just about health in low-income countries; it is about common health problems faced by human population as a whole. As the world has become more globalized, so too has health. Diseases do not respect political boundaries, thus global cooperation is critical for our collective survival. Health is closely linked with economic and social development and has important implications for global security and freedom.

This course will address the most critical issues in global health, introducing the socio-cultural, economic, political, and environmental factors that affect health of populations globally.

### [Course Goals]
* To introduce key concepts used in examining global health issues
* To gain insight into the current challenges of global health
* To gain an understanding of why tackling global health issues has the potential to reduce poverty, build stronger economies and promote peace

### [Course Schedule and Contents]
In principle, the course will include the following topics:

1. Introduction to global health
2. Global health policy
3. Health determinants and measurements
4. Health and development
5. Child and maternal health
6. Infectious diseases
7. Non-communicable diseases
8. Culture and behavior
9. Mental health
10. Global environment
11. Injuries
12. Technology and health
13. International cooperation

All topics will be delivered in 14 classes. The order of the topics are subject to change. There is no final exam for this course.

### [Method, Point of view, and Attainment levels of Evaluation]
The course is presented in lecture/discussion format and may include videos and guest speakers.

Grading will be based on:
- Group discussion/presentation (50%)
- Written assignments (50%)

### [Textbook]
Not used

### [Reference book, etc.]
(Reference book)
The course may use chapters from textbooks and readings from academic literature. Students will be provided with a list of recommended readings for each topic in due time.

### [Regarding studies out of class (preparation and review)]
* Students will do additional research on their own to prepare short written assignments/presentation. Further details will be provided during class.
* Students are expected to actively participate in class and complete reading assignments.

### [Others (office hour, etc.)]
Seminars will be held at:
Science Frontier Laboratory, Faculty of Medicine Campus, Small seminar room (1F).

Please visit KULASIS to find out about office hours.
## Outline and Purpose of the Course

It is a classical question from centuries ago whether a quintic (or of higher degree) polynomial equation is solvable in terms of its coefficients, with only use of the usual operations (addition, subtraction, multiplication, division) and application of radicals (square roots, cube roots, etc). Galois theory was born to answer this question, the answer to which turns out to be negative in general. On the other hand, Galois theory has gone far beyond this and is rightly regarded as one of the central features of modern mathematics nowadays, which is in particular fundamental for the study of arithmetic problems.

Although the so-called "fundamental theorem of Galois theory" is commonly considered as the summit of undergraduate algebra, which usually takes a year to reach, in this course we learn to prove the unsolvability of the general quintic equation with as little Galois theory as possible. Along the way, we shall see the elegance and beauty of modern/abstract algebra.

It is worth mentioning that abstract algebra has also found applications in science and engineering, e.g. in cryptography.

## Course Goals

We will learn the basic concepts and theorems in group theory, ring theory, field theory, and Galois theory. At the end, we shall also be able to determine which polynomial equations are solvable in radicals.

## Course Schedule and Contents

We intend to cover a big chunk of modern algebra in a condensed and interesting way, to make it accessible to most undergraduate students. Both concepts and examples will be emphasized.

Below is the plan and contents of the course. (The lectures, as well as the order of the lectures, may be modified, depending on students' background and understanding of the course materials.)

- Set Theory [1 week]: Notion of sets, mappings, mathematical induction, Zorn's lemma.
- Group theory [3-4 weeks]: Definition and examples of groups, homomorphisms, abelian groups, symmetric groups, Sylow's theorem.
- Ring theory [3-4 weeks]: Definition and examples, ideals, quotient rings, polynomial rings.
- Field theory [2-3 weeks]: Definition and examples, field extensions, polynomials, finite fields.
- Galois theory [3-4 weeks]: Galois extensions, roots of unity, solvability.

## Class requirement

It is helpful to know basics in linear algebra, but not required.

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

The evaluation consists of three weighted parts:
- Discussion performance in class (25%).
- One in-class presentations (25%): Each student reviews some topic assigned by the instructor.
- Final presentation (50%): A student will select their own topic among the topics provided by the instructor.

## Textbook

D. Dummit, R. Foote 『Abstract Algebra. 3rd edition.』
S. Lang 『Algebra。』(Springer; 3rd rev. edition)

## Reference book, etc.

N. Bourbaki 『Algebra: Chapters 1-3』 (Springer; 1st ed. 1974. 2nd printing edition)

Other supplemental materials will be introduced during the classes.

## Regarding studies out of class (preparation and review)

Along with preparation and review, students are encouraged to form study groups.

## Others (office hour, etc.)

Lecture code: Z002041
You see and use liquids such as water and oils, but also stuff like creams or glue, every day. But have you ever wondered what makes water stick to a window or how toothpaste flows out of the tube? I invite you to study the properties of liquids, how they flow, stick or spread, and gain a deeper understanding of their behavior, which is so important in nature and your daily life. This course will take a closer look on liquids from various perspectives, combining various fields but without getting lost too much into details. Students with any major are welcome.

**Course Goals**

Students will learn combine knowledge from multiple scientific fields to look at phenomena of liquids in daily life. They will be able to understand liquid behavior from a scientific viewpoint, which also fosters the students’ ability to apply theoretical concepts to real-life problems as a whole. At the same time, the ability to discuss about effects and concepts in natural sciences in English will be developed.

**Course Schedule and Contents**

The course will work through several aspects of liquids, which include the following topics. This seminar is held in a causal and interactive way. Students can influence the selection of topics based on their interest. The plan below is not strict and rather serves as a guideline.

1. Introduction to liquids - Honey, toothpaste or even sand? (3 weeks)
2. Oil and water do not mix? (4 weeks)
3. We learn why liquids form and which different forces hold liquids together.
4. The shape of a raindrop and the lotus effect. (4 weeks)
5. We take a closer look at liquid surface and interface effects such as adhesion, cohesion, surface tension.
6. How to get ketchup out of the tube? (3 weeks)

Depending on the available time and interest of the students, we may also discuss topics such as the application of liquids in nature, science, and technology or exotic liquids such as ionic or magnetic liquids.

---

Lecture code: Z002031
ILAS Seminar-E2 : Programming for data analysis

**Outline and Purpose of the Course**

R programming language is a useful environment for statistical data analysis and graphical display. The R language is widely used in many fields of science, for data processing, analysis, and visualization. In this course, I will introduce basic R programming techniques and objects. Using example applications, I will also illustrate the use of R for running statistical tests, machine learning, data visualization, and the R Bioconductor packages.

**Course Goals**

Students will learn the basic features of the R language for data manipulation, computation, and visualization. They will learn how to write your own code and functions, and how to use publicly available packages. Example applications introduced during the course will give students enough experience to use R for their own analysis.

**Course Schedule and Contents**

In principle, the course will be offered according to the following plan. However, depending on the progress of the course, the number of lectures for each topic may change.

1. Introduction to R: We will introduce R, its main features, and advantages and disadvantages. Using R interactively, we will discuss some simple data types and commands.
2. Simple manipulations, numbers and vectors: In this session, we will continue introducing simple operations. We will also discuss vectors, how to access their elements, and how to manipulate them.
3. Arrays and matrices: We will cover how to make arrays and matrices, and how to apply commands on them. Outer products, determinants, transpose, inverse matrices and matrix multiplication will be introduced.
4. Lists and data frames: We will introduce lists and data frames, and their basic commands and features.
5. Reading data from files: We will discuss several ways of reading in data from files, and how to store them into variables. Also, we will cover commands for writing data to files.
6. Plotting (part 1): We will introduce the plot() function and its properties. We will discuss manipulations such as changing line types, colors, sizes.
7. Plotting (part 2): We will discuss several other types of plots available in R, such as histograms, dot plots, pie charts, and box plots.
8. Statistical tests (part 1): R is particularly useful for applying statistical tests on data. In this and the next session, we will introduce commands related to probability distributions, and commands for applying various statistical tests.
9. Statistical tests (part 2): In this session we will continue on the previous session. We will also cover statistical models for conducting linear and non-linear regression analysis.
10. Functions (part 1): So far we have only used pre-defined functions. In these two sessions, we will discuss how to write your own functions for manipulating and processing various types of data. In the first session, we will introduce a first simple customized function.
11. Functions (part 2): In this second session, we will write more complex functions, and discuss properties of input parameters, how to check input, how to return output, and error handling.
12. Libraries and packages, CRAN: Apart from pre-installed functions, there are thousands of libraries and packages publicly available. Here we will discuss how to find such packages in the Comprehensive R Archive Network (CRAN), how to install them, find documentation, and use them.
13. R Bioconductor: R Bioconductor offers packages and tools specifically for the analysis of biological data. We will introduce Bioconductor, how to find, install and use packages. A few useful packages will be covered.
14. Review of course material.
15. Final examination
16. Feedback

**Class requirement**

None

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

Grading: attendance and active participation (20%), mid-term exam (20%), quizzes/assignment (20%), and final exam (40%)

**Textbook**

Richard Cotton / Learning R: A Step-by-Step Function Guide to Data Analysis (first edition) / O'Reilly Media ISBN-978-1449357108 (The course lectures will roughly follow the content of this textbook. It will be supplemented with additional material, including an introduction to R available on the CRAN website (https://cran.r-project.org/manuals.html)).

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

The course will follow a textbook. At the end of each lecture, I will specify the sections to read before the next lecture.

**Others (office hour, etc.)**

It is strongly recommended to bring a laptop to the class.

No fixed office hours. Students are requested to make appointments directly or by email.

We will be using RStudio to learn programming in "R".
Course title
ILAS Seminar-E2: Regional Disaster Prevention (地域防災学)

Affiliated department, Job title, Name
Graduate School of Agriculture Assistant Professor, VILAYVONG, Khonesavanh

Group
Seminars in Liberal Arts and Sciences

Number of credits
2

Number of weekly time blocks
1

Class style
Seminar

Course offered year/period
2018 • First semester

Quote (Freshman)
25 (15)

Target year
Mainly 1st year students

Eligible students
For all majors

Day/period
Thu. 5

Classroom
TBA (North Campus)

Language
English

Keyword
Agriculture and forestry / Climate change / Disaster risk reduction / Ecosystem / Food security

Outline and Purpose of the Course
This course presents general aspects of hazards and disasters. The course offers the fundamental knowledge to help increasing students' understanding on the management approaches to combat crises and disasters related to energy, environment and disasters. Climate change-induced drought and flood, desertification, food security, energy resources, disaster risk assessment, vulnerability, mitigation, preparedness, responses, recovery, resilience, total disaster risk reduction and disaster risk assessment and management are main keywords of the course.

Course Goals
1. To introduce students with knowledge, concept and terminology on disasters and methods of prevention.
2. To encourage students' technical discussion and presentation on disasters prevention and risk reduction.
3. To facilitate students in applying knowledge and lessons in finding innovation and solution for disasters prevention and risk reduction.

Course Schedule and Contents
1. Introduction
2. Natural events, agriculture and food security
3. Hazard, risk, and disaster in agriculture and forestry (A&F)
4. Impact of disasters in A&F
5. Climate change related hazards and disasters
6. Climate change: mitigation and adaptation
7. Student's Presentation (1)
8. Disaster management in agriculture and forestry (1)
   - Vulnerability
   - Mitigation
9. Disaster management in agriculture and forestry (2)
   - Preparedness
   - Response
   - Recovery
10. Disaster resilience in A&F
11. Forests and natural disaster risk reduction
12. Ecosystem-based disaster risk reduction in Japan
13. Student's Presentation (2)
14. ICT in disaster management for agriculture and forestry (1)
15. ICT in disaster management for agriculture and forestry (2)

Class requirement
None

Method, Point of view, and Attainment levels of Evaluation
Class participation (25%), attendance (25%), assignment report (25%) and oral presentation (25%)

Textbook
Reading materials and handouts will be distributed.

Reference book, etc.
To be announced during classes.

Regarding studies out of class (preparation and review)
Students are expected to be independent in finding online resources to attain relevant issues of discussion during seminar to enhance student interaction and understanding during classes.

Others (office hour, etc.)
After class, student consultation will be arranged with prior notice.

Lecture code: Z002056
1. Presentation

Sadly, 95% of presentations are really not interesting. Really? No, it is actually 99%

In fact, when we attend a presentation, we often see members of the audience sleeping. This is a problem.

Most people <have to> give presentations at conferences or business meetings.

Unfortunately, most presentations are:
* long
* boring
* bad slides
* no meaning

What we actually <want> is:
* short
* simple
* easy to understand
* entertaining

In this class, students will learn what is important to give a great presentation. They will see that presentations can be <fun>.

2. Debate

Most Japanese students do not like debate. However, this can be fun, too, if you just try!

In the class, we will first find a topic, which the class is interested in.

Before the debate, students will research about the topic and choose their arguments.

Then, students will choose the Pro- or Contra-side (about 3 students each).

Next is the actual debate. Now, students in the pro- and contra-groups will deliver their speeches (2-3 minutes per speaker). The audience group will actively join the floor discussion.

At the end of the debate we will discuss whether the pro- or the contra-group delivered the more convincing speeches.

[Course Goals]
This seminar focuses on developing the students' ability to present and discuss scientific matters in English. This class mainly aims at (i) raising the students' confidence in talking about non-trivial things in a foreign language, (ii) making sure that the points presented by the students are indeed logically connected and (iii) being able to deal with questions and answers.

[Course Schedule and Contents]
1. Course Introduction [Weeks 1-2]
2. Presentation Preparation [Weeks 3-5]
3. Presentation Design [Weeks 6-8]
4. Presentation Delivery [Week 9]
5. Final Presentation by the Students (evaluation) [Week 10]
6. Debating [Week 11-14]
7. Feedback [Week 16]

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Active participation is absolutely required in this seminar. In the debating part, students are expected to talk about scientific matters in English. In the presentation section, not only the presenter, but all students are expected to ask questions or share their opinion about the subject in English.

Attendance and Active participation [60%]
Assignments (presentation and debate) [40%]

[Textbook]
Not used
### [Regarding studies out of class (preparation and review)]

* Research on assigned presentation topics.
* Preparation of presentations.
* Research about debate topics

### [Others (office hour, etc.)]

Office hour: any time.
**Course title**
ILAS Seminar-E2 : Introduction to life science and scientific discussion

**Affiliated department, Job title, Name**
Graduate School of Medicine
Assistant Professor, Erik WALINDA

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<th>Group</th>
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<th>Number of weekly time blocks</th>
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<td>Seminars in Liberal Arts and Sciences</td>
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<td>1</td>
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<th>Course offered year/period</th>
<th>Quota (Freshman)</th>
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<td>2018 • First semester</td>
<td>10 (8)</td>
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<th>Day/period</th>
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<tr>
<td>Mainly 1st year students</td>
<td>For all majors</td>
<td>Fri.5</td>
<td>21, Yoshida-South Campus Bldg. No. 1</td>
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<th>Keyword</th>
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<tbody>
<tr>
<td>Life / Biophysics / Chemistry / Structure / Biology</td>
<td>English</td>
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</table>

**[Outline and Purpose of the Course]**
This is an introductory course to life science and biochemistry. It is a tutorial. That means, that after a short introduction by the instructor, students will study and then discuss the material. The material will be provided by the instructor; it is not necessary to buy any books for this class. Discussions are in English and the instructor will provide additional explanations.

3D means the three dimensions of space: we will look at images of proteins and nucleic acids to understand them. 4D means space and time: we will also study the motion of the biomolecules.

**[Course Goals]**
The goal of the course is to give first year students a chance to study the basics of life science in English in an interactive way.

**[Course Schedule and Contents]**
1. Course Introduction: Studying life
2. Atoms
3. Macromolecules
4. Structural levels in proteins
5. Life in 3D
6. Carbohydrates
7. Lipids
8. Nucleic Acids
9. Vitamins
10. Cells
11. Organelles I
12. Organelles II
13. Organelles III
14. Cytoskeleton
15. Evaluation
16. Feedback

**[Class requirement]**
None

**[Method, Point of view, and Attainment levels of Evaluation]**
Attendance and Active participation [60%]
Assignments (Presentation) [40%]

**[Textbook]**
Not used

**[Reference book, etc.](Reference book)**
David Sadava  "Life: the science of biology"

**[Regarding studies out of class (preparation and review)]**
* Reading of scientific texts in English.
* Preparation of presentations.

**[Others (office hour, etc.)]**
Office hour: any time.
# ILAS Seminar-E2: Topics in Frontier Physics

<table>
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<tr>
<th><strong>Course title</strong></th>
<th>English: ILAS Seminar-E2: Topics in Frontier Physics (現代物理学の最先端)</th>
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<tr>
<td><strong>Affiliated department, Job title, Name</strong></td>
<td>Graduate School of Science, Associate Professor, WENDELL, Roger</td>
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<td><strong>Group</strong></td>
<td>Seminars in Liberal Arts and Sciences</td>
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<td><strong>Number of credits</strong></td>
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<td><strong>Number of weekly time blocks</strong></td>
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<td><strong>Course offered year/period</strong></td>
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<td><strong>Target students</strong></td>
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<td><strong>Day/period</strong></td>
<td>Mon. 5</td>
</tr>
<tr>
<td><strong>Classroom</strong></td>
<td>204, Yoshida-South Campus Bldg. No. 4</td>
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<td><strong>Language</strong></td>
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<td><strong>Keyword</strong></td>
<td>Modern Physics / Nobel Prize / Physics Discoveries</td>
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</table>

## [Outline and Purpose of the Course]

This class will introduce students to new and exciting topics in modern physics. Recent discoveries and Nobel prize-winning research will be discussed in straightforward terms so everyone can understand and enjoy modern science. Lectures and discussions will be held in English and will cover a wide variety of topics in recent research. Even students with no previous physics experience are encouraged to join this class and learn about how we understand the world today.

## [Course Goals]

Students in this course will learn about the fundamental physics behind recent topics in modern research as well as how they are applied in the real world. In addition, students will be introduced to and practice speaking in scientific English.

## [Course Schedule and Contents]

Each week a different topic in modern physics and cosmology will be presented. The following week will provide a review of material with discussion. Topics will include some of the following:

- Discovery of the Higgs boson
- Observation of gravitational waves
- Neutrinos and their oscillations
- Radiation in the modern world
- The history and accelerating expansion of the universe
- Quarks and CP symmetry
- Lasers for trapping atoms
- From the birth of stars to supernovae

In addition to the above, students may request lectures on a few topics of their choice.

## [Class requirement]

None

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Lecture code: Z002039
ILAS Seminar-E2: Frontiers in Theoretical Physics II

Course title: English
ILAS Seminar-E2: Frontiers in Theoretical Physics II

Affiliated department, Job title, Name: Hakubi Center for Advanced Research Program-Specific Assistant Professor, Werner, Marcus Christian

Group: Seminars in Liberal Arts and Sciences
Number of credits: 2
Number of weekly time blocks: 1

Class style: Seminar
Course offered year/period: 2018 - First semester
Quota (Freshman): 10 (7)

Target year: Mainly 1st year students
Eligible students: For all majors
Day/period: Thu. 5

Classroom: B4, Yoshida-South Campus Academic Center Bldg. West Wing
Language: English

Keyword: Theoretical Physics / 理論物理学 / Astrophysics / 天体物理学

[Outline and Purpose of the Course]
It is an exciting time to study the fundamental physics of the universe! For example, the recently announced first observation of gravitational waves will open up an entirely new gravitational sky.

In this course, we will approach the frontiers of physics by reading articles in English, mainly from Physics Today. There will be a focus on astrophysics-related topics, but the course will cover the entire range, including, for example, quantum mechanics and fluid dynamics. The papers discussed here will be different from those in "Frontiers in Theoretical Physics I," though broadly similar in style.

Each seminar will consist of three parts: first, I will give a lecture-style introduction to the topic; then one of the students will present the content of a paper which all of us will have read in advance; followed by a general discussion of the material and, perhaps, suggestions of new ideas. The class will be small, informal and interactive.

[Course Goals]
The primary goal of the course is to gain an overview of recent developments in physics, as well as a deeper understanding of selected aspects. Students will also be encouraged to reflect critically upon methodological issues in physics.

At the same time, the course aims to improve students' skills of English conversation and text comprehension. This is particularly important in science, where basically all research is published in English.

[Course Schedule and Contents]
1. In the first week, I will discuss a paper so that students can gauge typical contents of the articles and the style of presentation;
2. Then each week, a small selection of articles to be prepared for a later week is presented to one of the students, who can make the choice based on his or her preference;
3. The students will present papers in turn, and the cycle will depend on the total number of class attendees. If necessary or preferred, papers may also be prepared in groups;
4. There will be no examination or class meeting during the exam week;
5. I will provide a course summary for the feedback session which will take place in the last week, after the end of exams.

[Class requirement]
Interest in physics. Prior knowledge of advanced topics, though beneficial, is not required.

[Method, Point of view, and Attainment levels of Evaluation]
There is no final examination. The evaluation will be based upon students' attendance and contributions in class.

[Textbook]
Not used

[Reference book, etc.]
(Reference book)
Introduced during class

[Regarding studies out of class (preparation and review)]
Students will be expected to read or prepare one paper per week in advance, as assigned during class.

[Others (office hour, etc.)]
Office hours will be announced during class.
ILAS Seminar-E2 : Urban Pest Management

Group: Seminars in Liberal Arts and Sciences
Number of credits: 2
Number of weekly time blocks: 1

Class style: Seminar
Course offered year/period: 2018 • First semester
Quota (Freshman): 10 (5)

Target year: Mainly 1st year students
Eligible students: For all majors
Day/period: Thu.5

Classroom: Seminar room 22, ILAS Bldg.
Language: English

Keyword: Pest management / Nuisance pest / Venomous pest / Medical entomology / Urban ecosystem

Outline and Purpose of the Course

This is a seminar-based course, consisting different types of activities including lecture, reading/discussion and hands-on. The course is designed to understand the urban environment and pests associated with it. Three major themes will be focused in this lecture:

1. urbanization and urban ecology;
2. introduction of various important urban pests and their impacts;
3. how to manage urban pests effectively.

The lecture will start with a standard lecture in the first several weeks, followed by reading assignment/discussion and hands-on section in the rest of the semester. The hands-on section will include an examination of pest specimen, survey for pests in the campus, design of a pest trap and demonstration of various pest control device. Students are highly encouraged to interact with the instructor in class.

Course Goals

While urbanization has led to comfortable and better life quality, urban environments have created excellent breeding grounds for many pests of human concern. This course is therefore designed to strengthen students' understanding of these pests (insects, spiders, rodents and stray animals) in the urban settings, as well as how to properly manage them in a smarter way.

Course Schedule and Contents

Week 01: Course introduction
Week 02: Introduction to URBAN ECOLOGY (lecture)
Week 03: What is PEST? Where are they in an urban environment? (lecture)
Week 04: What is PEST MANAGEMENT? How does it work? (lecture)
Week 05: Biology and ecology of cockroach (lecture)
Week 06: Control and management of cockroach (reading/hands-on)
Week 07: Biology and ecology of urban ant (lecture)
Week 08: Control and management of urban ant (reading/hands-on)
Week 09: Biology and ecology of termite (lecture)
Week 10: Control and management of termite (reading/hands-on)
Week 11: Fly and mosquito & control (lecture/reading/hands-on)
Week 12: Other insects as an urban pest & their management (lecture/reading/hands-on)
Week 13: Non-pest urban pests & their management (lecture/reading/hands-on)
Week 14: Student presentation
Week 15: Finals
Week 16: Feedback

Course offered year/period: 2018 • First semester
Day/period: Thu.5

Classroom: Seminar room 22, ILAS Bldg.
Language: English

Outline and Purpose of the Course

This is a seminar-based course, consisting different types of activities including lecture, reading/discussion and hands-on. The course is designed to understand the urban environment and pests associated with it. Three major themes will be focused in this lecture:

1. urbanization and urban ecology;
2. introduction of various important urban pests and their impacts;
3. how to manage urban pests effectively.

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Course Goals

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Course Schedule and Contents

Week 01: Course introduction
Week 02: Introduction to URBAN ECOLOGY (lecture)
Week 03: What is PEST? Where are they in an urban environment? (lecture)
Week 04: What is PEST MANAGEMENT? How does it work? (lecture)
Week 05: Biology and ecology of cockroach (lecture)
Week 06: Control and management of cockroach (reading/hands-on)
Week 07: Biology and ecology of urban ant (lecture)
Week 08: Control and management of urban ant (reading/hands-on)
Week 09: Biology and ecology of termite (lecture)
Week 10: Control and management of termite (reading/hands-on)
Week 11: Fly and mosquito & control (lecture/reading/hands-on)
Week 12: Other insects as an urban pest & their management (lecture/reading/hands-on)
Week 13: Non-pest urban pests & their management (lecture/reading/hands-on)
Week 14: Student presentation
Week 15: Finals
Week 16: Feedback

Outlines

Class requirement
None

[Method, Point of view, and Attainment levels of Evaluation]
40% in-class discussion; 40% term paper; 20% hands-on

[Textbook]

[Reference book, etc.]
RTT Forman Urban ecology-science of cities. (Cambridge University Press, 2014)

[Regarding studies out of class (preparation and review)]
Students are encouraged to preview lecture materials ahead of the class each week as class materials will be uploaded to KULASIS and PanDa at least one day in advance.

Others (office hour, etc.)
Lecturer: Chin Cheng Yang (ccyang@rish.kyoto-u.ac.jp)
Office: HW 412, Research Building No. 1, Uji Campus
Office hours: to be announced
Note: There is a possibility that the instructor may organize a field trip that normally is a one-day event on the weekend, instead of the regular slot of this lecture. The lecturer will discuss date and time with students for the field trip at the beginning of the semester. Students are advised to pay the travel expense. Also be advised to obtain the insurance for study and research “Personal Accident Insurance for Students Pursuing Ed. & Rsch.(学生教育研究災害傷害保険)” if you decide to take the class.
**Course title**
ILAS Seminar-E2: Minds and Machines- Can a Machine Think

**Affiliated department, Job title, Name**
Graduate School of Medicine
Senior Lecturer, ZENAS C. CHAO

<table>
<thead>
<tr>
<th>Group</th>
<th>Seminars in Liberal Arts and Sciences</th>
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<tbody>
<tr>
<td>Number of credits</td>
<td>2</td>
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<td>Number of weekly time blocks</td>
<td>1</td>
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**Class style** Seminar

**Course offered year/period** 2018 • First semester

**Quota (Freshman)** 18 (15)

**Target year** Mainly 1st year students

**Eligible students** For all majors

**Day/period** Thu. 5

**Classroom** 3A, Yoshida-South Campus Academic Center Bldg. North Wing

**Language** English

**Keyword** Mind / Brain / Artificial Intelligence / Neuroscience / Robot

### [Outline and Purpose of the Course]
This course examines the nature of mind and the prospect of artificial intelligence. Students will have class discussions and debates about issues such as “what is the mind?” and “can a machine think?” During the course, students will learn to make philosophical and scientific arguments, and to express them in writing and presentation. Final project is to build an “intelligent” LEGO Robot (no programming experience required).

### [Course Goals]
1. To investigate fundamental issues relating to our minds philosophically and scientifically.
2. To express investigation results in discussion, writing, and presentation.
3. To design an autonomous LEGO robot.
4. To work with others as both a team member and leader.

### [Course Schedule and Contents]

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<thead>
<tr>
<th>No.</th>
<th>Title</th>
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<tr>
<td>(1)</td>
<td>Introduction</td>
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<td>(2)</td>
<td>Part I: The Philosophy of Mind</td>
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<td>Chinese Room Argument- Can a Computer Have a Mind?</td>
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<td>Debate Practice</td>
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<td>Turing Test- How Intelligent Can a Computer Be?</td>
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<td>Physicalism vs. Dualism- Are the Mind and Body the Same Thing?</td>
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<td>Personal Identity- Who Am I?</td>
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<td>Midterm Project- Group Debate</td>
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<td>(8)</td>
<td>Midterm Project- Group Debate</td>
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<td>(9)</td>
<td>Part II: The Science of Mind</td>
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<td></td>
<td>LEGO Robot Programming Tutorial</td>
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<td>Mind Reading &amp; Mind Control</td>
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<td>Self &amp; Free Will</td>
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<td>Consciousness</td>
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<td>Machine Minds</td>
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<td></td>
<td>Final Project- LEGO Robot Sumo Competition</td>
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</tbody>
</table>

### [Class requirement]
None

### [Method, Point of view, and Attainment levels of Evaluation]
In-class discussion (~40%), midterm project (~30%), final project (~30%).

### [Textbook]
Not used

### [Reference book, etc.]
Introduced during class

### [Regarding studies out of class (preparation and review)]
Students will need to prepare for class discussions, which will be assigned at least a week earlier. For the midterm and final projects, students are expected to meet up with their team members on a weekly basis.

### [Others (office hour, etc.)]
ILAS Seminar (Overseas) : Conflict Management (Global Water Issues)

Affiliated department, Job title, Name
Disaster Prevention Research Institute, Professor, SUMI TETSUYA
Disaster Prevention Research Institute, Associate Professor, Sameh Kantoush

Course title
Conflict Management [Global Water Issues]

Group
Seminars in Liberal Arts and Sciences

Number of credits
2

Course offered year/period
2018* Intensive, First semester

Quota (Freshman)
10 (5)

Target year
Mainly 1st year students

For all majors

Day/period
Intensive, IBA

Classroom
Vietnam

Language
English

Keyword
(Conflict Management) / (Vietnam) /

Outline and Purpose of the Course

Disaster prevention and management, especially in the context of climate change and water resources management in the Mekong Delta. The course aims to provide students with a comprehensive understanding of the complexities involved in managing water resources in the context of climate change, and to equip them with the skills and knowledge necessary to address these challenges.

Method, Point of view, and Attainment levels of Evaluation

1) Lectures
- Impacts of Climate Change on the Mekong River Basin Water Resources
- Integrated Management and Master Plan of the Mekong Delta
2) Field survey and practices
- Water resources management in the Mekong River Delta
- Water quality in the coastal zones of the Mekong Delta
3) Presentation
- Making report and presentation at the workshop

Course Schedule and Contents

1) Introduction to Water Diplomacy
2) State of the Mekong River Basin
3) Water management in the Mekong Delta and the Development Projects

Textbook
Not used

Related URL

Related studies out of class (preparation and review)

Course offered 2015/2016

Others (office hour, etc.)

1) Introduction to Water Diplomacy
2) State of the Mekong River Basin
3) Water management in the Mekong Delta and the Development Projects

Lecture code: Z003006
Outline and Purpose of the Course

This seminar will enable students to develop critical understanding of a range of qualitative research methodologies and apply their use to specific health care scenarios. We will run workshops to explore the key methodologies and different methods in qualitative research using real examples from research projects. We will also run a journal club where students will be encouraged to critically appraise the appropriateness of a range of different methodologies in qualitative research. This knowledge will enhance students ability to critique the value and quality of research evidence underpinning clinical practice.

[Course Goals]

To understand the concept of qualitative research/ versus quantitative research
To understand different schools of thought in qualitative research
To explore different methodologies in qualitative research
To understand quality criteria for evaluation of qualitative research

[Course Schedule and Contents]

Session 1: Introduction to the seminar and introductions of the members of the group
Session 2: Definitions of qualitative research and key principles
Session 3: Different theoretical schools of thought
Session 4: Key methodologies in qualitative research
Session 5-6: Work on examples of qualitative data, role play
Session 7: Feedback, review on methodologies
Session 8: Introduction to evaluation of qualitative research- quality criteria
Session 9-12: Quality assessment of real publications of qualitative research
Session 13-15: Presentations- course feedback

[Class requirement]

None
Birds fascinate people because they are everywhere, they are easy to see and hear, and they are beautiful. In this course we will examine birds by considering their defining characteristics, form and function, behaviour, life histories, ecology, and conservation. In doing so, the aim is gain a thorough understanding of this diverse and interesting group of animals.

**[Course Goals]**

1) Learn the evolutionary history of modern birds and their evolutionary relationships to other groups
2) Learn the characteristics of birds and the characteristics of the major avian groups
3) Learn the unique life history and behavioral traits of birds
4) Learn some aspects of avian ecology and conservation
5) Learn to identify birds around the Kansai region

**[Course Schedule and Contents]**

1) Course introduction: what are birds?
2) The diversity of birds: avian evolutionary history and systematics
3) Feathers and flight (video 1)
4) Avian physiology
5) Senses, brains, and intelligence
6) Avian communication (video 2)
7) The annual cycle of birds and their migration (video 3)
8) Social behavior
9) Finding a mate and breeding systems (video 4)
10) Avian reproduction
11) Parents and offspring
12) Lifetime reproductive success
13) Populations, species, and communities
14) Bird conservation
15) Final Exam
16) Feedback

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Lecture code: Z002036
Course title: ILAS Seminar-E2: Introduction to the biology of nematodes

Affiliated department, Job title, Name: Graduate School of Biostudies, Associate Professor, CARLTON, Peter

Group: Seminars in Liberal Arts and Sciences

Number of credits: 2
Number of weekly time blocks: 1

Class style: Seminar
Course offered year/period: 2018, Second semester

Target year: Mainly 1st year students
Eligible students: For all majors
Day/period: Thu. 5

Classroom: FB, Yoshida-South Campus Academic Center Bldg. North Wing
Language: English

Keyword: biology / genetics / genome / nematodes

Outline and Purpose of the Course:
This class will introduce to students one of the most abundant forms of life on earth: the Nematodes or roundworms. The most famous of these is the useful model organism called Caenorhabditis elegans. The goal of the class is to provide both a survey of how scientists use the worm to conduct research, demonstrate the worm's great importance to biology, and provide hands-on experience with simple worm manipulation. Students will learn directly about some of the current biological questions that are being addressed with this versatile model organism. We will also find wild nematodes around Kyoto, make scientific observations on them, and use DNA sequencing to identify their species. This small seminar will combine instruction with in-class demonstrations.

Course Goals:
- To understand the biology and diversity of nematodes
- To understand the uses of the nematode Caenorhabditis elegans in modern biological research
- To understand the anatomy and life cycle of C. elegans
- To learn how to create new strains containing desired mutations by designing crosses between animals
- To acquire the knowledge and experience needed to begin genetic research with C. elegans

Course Schedule and Contents:
1. Overview of the course; nematodes and the place of C. elegans in the tree of life
2. Development, anatomy, and life cycle (I)
3. Development, anatomy, and life cycle (II)
4. Wild Worms of Kyoto (I): worm collecting
5. Mutants with observable phenotypes (with microscopy observation)
6. Basic worm genetics: selecting and crossing (with microscopy observation)
7. Meiosis part 1: how chromosomes pair
8. Meiosis part 2: how chromosomes recombine
9. Mapping genetic mutations
10. Reverse genetics: genome editing
11. Sex determination and dosage compensation
12. Wild Worms of Kyoto (II): observation
13. Wild Worms of Kyoto (III): DNA sequencing
14. The whole genome sequence of C. elegans and its relatives
15. Using nematode diversity to discover new biology

Class requirement:
This is an introductory course. There are no requirements, but a basic familiarity with biology and genetics will be beneficial.

Method, Point of view, and Attainment levels of Evaluation:
Evaluations will be based on participation, short quizzes, and either a final exam or a term paper. Each area will contribute 1/3rd of the total grade.

Textbook:
Instructed during class

Reference book, etc.:
Fay, Starr, Spencer, Johnson『Worm Breeding for Dummies: A guide to genetic mapping in C. elegans』 (PDF textbook)

Regarding studies out of class (preparation and review):
Students will have to understand technical vocabulary in English. This may require studying outside of class hours.

Others (office hour, etc.):
Office hours will be 1 hour once per week, schedule to be announced on the first day of class.

This class involves some genetic experiments on nematodes.

Lecture code: Z002034
ILAS Seminar-E2: Radical Art and Politics in Japan 1960-70 (Graduate School of Engineering, Professor, DANIELL, Thomas)

Group: Seminars in Liberal Arts and Sciences
Number of credits: 2
Number of weekly time blocks: 1

Class style: Seminar
Course offered year/period: 2018, Second semester
Quota: 10 (5)

Target year: Mainly 1st year students
Eligible students: For all majors
Day/period: Tue. 5
Classroom: 21, Yoshida-South Campus Bldg. No. 1

Keyword: art / politics
Language: English

[Outline and Purpose of the Course]
This seminar will look at the convergence of radical art and radical politics in 1960s Japan, from the Anpo protests in 1960 to the university riots in the late 1960s and the demonstrations against the Osaka Expo in 1970. We will examine the work and ideas of art collectives such as the Neo-Dadaism Organizers and High Red Center, events such as the Independents exhibitions, and the contemporaneous writings of art critics.

[Course Goals]
By the end of this course, students will have gained a broad understanding of the topic and learned how to make a critical response to the assigned readings.

[Course Schedule and Contents]
The course will comprise close readings of critical texts in the fields of art, architecture, music, photography, and performance. Movements and groups to be discussed include: Mavo; Neo-Dadaism Organizers; Hi-Red Center; Metabolism; Experimental Workshop; The Play; Group Ultra Niigata; Gutai Art Association.

[Class requirement]
Students must be able to participate in discussions with their classmates in English, and have the courage to question group and individual assumptions. They should also have an understanding of research methods, and know how to access information and other resources in a timely fashion.

[Method, Point of view, and Attainment levels of Evaluation]
Grades will be determined by a combination of attendance, quality of presentation, and participation in discussions.

[Textbook]
Readings will be distributed in class.

[Reference book, etc.]
- Alexandra Munroe et al., Gutai: Splendid Playground (New York: Guggenheim Museum, 2013)
- Paul Roquet, Ambient Media: Japanese Atmospheres of Self (Minneapolis: University of Minnesota Press, 2016)

[Regarding studies out of class (preparation and review)]
In addition to presentations by the instructor, each student will be assigned a topic and one or more salient texts. They must read, analyze, and summarize the texts, then present the content to the other students and lead a discussion on the issues raised.

[Others (office hour, etc.)]
Office hours will be announced in class. For questions about the course or to arrange a meeting, email the instructor.
### Course title
ILAS Seminar-E2 : What is light?

### Affiliated department, Job title, Name
Graduate School of Engineering
Senior Lecturer, DE ZOYSA, Menaka

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of credits</th>
<th>Number of weekly time blocks</th>
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<tr>
<td>Seminars in Liberal Arts and Sciences</td>
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<thead>
<tr>
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<th>Course offered year/period</th>
<th>Quota (Freshman)</th>
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<tr>
<td>Seminar</td>
<td>2018 • Second semester</td>
<td>10 (10)</td>
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<th>Eligible students</th>
<th>Day/period</th>
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</thead>
<tbody>
<tr>
<td>Mainly 1st year students</td>
<td>For all majors</td>
<td>Thu. 5</td>
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<table>
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<th>Language</th>
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<tbody>
<tr>
<td>34, Yoshida-South Campus Academic Center Bldg. North Wing</td>
<td>English</td>
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</table>

### Keyword
Light / Optics

#### [Outline and Purpose of the Course]
This seminar is for students to learn about the basic properties of light such as reflection, transmittance, interference, diffraction, emission, and absorption with the help of experimental demonstrations. Students will be asked to join laboratory tours, which help to understand the front-line technologies related to light-control.

#### [Course Goals]
- Understand the properties of light with the help of experiments.
- Learn about front-line technologies related to light-control.

#### [Course Schedule and Contents]
1. Overview of the course, introduction to light waves (1 week)
2. Introduction to vector calculus (1 week)
3. Fundamentals of light, wave equations (3 weeks)
4. Reflection, transmittance, total internal reflection (2 weeks)
5. Laboratory tour and experiments (2 weeks)
6. Interference and diffraction theories (2 weeks)
7. Light emission and absorption (1 week)
8. Laboratory tour and introduction of front-line technologies (2 weeks)

#### [Class requirement]
None

#### [Method, Point of view, and Attainment levels of Evaluation]
Evaluation will be based on participation (30%), discussion (30%), and homework (40%).

#### [Textbook]
Not used

#### [Reference book, etc.]
Introduction during class

#### [Regarding studies out of class (preparation and review)]
Students are required to do their homework.

#### [Others (office hour, etc.)]
Office hour: Anytime by email and appointments should be made via email or during the seminars.

Lecture code: Z002053
**Course title**
ILAS Seminar-E2: Earthquakes & Volcanoes - Prediction and Hazards

**Affiliated department, Job title, Name**
Graduate School of Science, Associate Professor, ENESCU, Bogdan Dumitru

**Group**
Seminars in Liberal Arts and Sciences

**Class style**
Seminar

**Number of credits**
2

**Number of weekly time blocks**
1

**Course offered year/period**
2018, Second semester

**Quota (Freshman)**
15 (10)

**Target year**
Mainly 1st year students

**Eligible students**
For all majors

**Day/period**
Thu. 5

**Classroom**
Room 152, Faculty of Science Bldg. No.1 (North Campus)

**Language**
English

**Keyword**
Earthquakes (地震) / Volcanoes (火山) / Prediction (予知) / Hazard (ハザード)

### [Outline and Purpose of the Course]
We are going to read scientific papers related to a topic that is important both scientifically and socially. Is it possible to predict the occurrence of large earthquakes and volcanic eruptions? What are the current scientific advances in this field? We will also learn about earthquake and volcano hazard and discuss ways to reduce the risk of associated disasters.

### [Course Goals]
The course aims to show students the importance of studying about natural disasters caused by earthquakes and volcanoes, which may help finding better ways to reduce their risk. To facilitate understanding, some materials/vocabulary in Japanese will be provided during the seminar. 漢字のキーワード等も含むので、遠慮なく参加してください。演説や地震学の面白さを学びながら、英語の能力も向上しましょう！

### [Course Schedule and Contents]
Each student is going to choose a paper and prepare a short report (a few PPT slides) summarizing the main ideas of the study. The paper can be chosen freely; some broad suggestions include:
- The physics of great earthquakes: any clues for predicting them?
- Large volcanic eruptions and possibilities of prediction;
- Earthquake and volcano hazard.

The first class will give students some broad options of topics/papers. During the second class we will decide the paper that each student is going to present. I will exemplify with a research presentation during the third class. Starting with the fourth class each student is going to present the chosen paper and will get feedback for improving his report. In the examination day, each student should present briefly his updated/revised report.

Depending on the number of students and available time, we could visit the underground seismic base isolation at the "Kyoto University Clock Tower", go to the nearby Hanaore Fault or visit the Disaster Prevention Research Institute (DPRI), Kyoto University (Uji Campus), to discuss with an earthquake scientist.

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**Lecture code:** Z002037

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**[Class requirement]**
None

**[Method, Point of view, and Attainment levels of Evaluation]**
Grading will be based on attendance and participation (60%) and presentation of chosen paper (40%).

**[Textbook]**
Not used

**[Regarding studies out of class (preparation and review)]**
The student will have to prepare the assigned paper.

**[Others (office hour, etc.)]**
Students can meet me during office hours with prior appointment.
The unique feature of earth is the existence of life, and the most extraordinary feature of life is its diversity. Climate, biodiversity and human well-being are inextricably linked. Many species are slowly disappearing from the face of earth. Thus, conservation of endangered species is a need of the present time to maintain the delicate balance in nature between the predator and prey. This, in turn, will enhance the forest cover and influence climatic changes crucial to agriculture. Conventional conservation methods based on habitat preservation can be effective only if inbreeding depression has not already set in. Thus, newer technologies for conservation are in much demand. The present seminar aims to educate the students about the existing and the upcoming technologies for conservation.

Course Goals
Students will be sensitized about the severe threats the wild population is currently facing. The seminar will bring forth ex-situ and in-situ approaches that are being used to conserve the threatened and endangered species. Through this seminar, students will be enticed to come up with ideas and plans for future strategies for conservation of wildlife that is endangered locally and globally. The seminar would discuss some of the practical approaches currently being utilized for conservation.

Course Schedule and Contents
1. Introduction
2. History and importance of wildlife
3. Current status of endangered species: The Japan chapter
4. Wildlife protection system in Japan
5. Genetics and conservation (two weeks)
6. Conservation breeding-Introduction to ex-situ conservation
7. Conservation breeding-Artificial insemination (AI)
8. Conservation breeding-In vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI)
9. Conservation breeding-Embryo transfer technology (ETT)
10. Conservation breeding-Reproductive cloning
11. Cryobiology in wildlife conservation
12. Why are we failing in conservation?
13. Practical approaches for conservation
14. Feedback (To be announced in the class)

Class requirement
None

[Method, Point of view, and Attainment levels of Evaluation]
The students will be assessed based on assignments (2, 10 points each), presentation (1, 30 points), quizzes (4, 10 points each), and discussions (10 points) in the class.

[Textbook]
The students will be provided soft copy of the presentation via KULASIS or email. Other reading material will also be provided, if necessary.

[Related URL]
http://www.reprod.kais.kyoto-u.ac.jp/(Laboratory Home Page)

[Regarding studies out of class (preparation and review)]
The students will be asked to prepare short talks and assignments which will be given during the course. Previous lecture's presentation will be discussed.

[Others (office hour, etc.)]
By appointment (To be announced in the class)
**ILAS Seminar-E2: Food Systems in Asia**

**Affiliated department, Job title, Name**
Graduate School of Agriculture
Program-Specific Senior Lecturer, Hart Nadav FEUER

**Group**
Seminars in Liberal Arts and Sciences

**Number of credits**
2

**Number of weekly time blocks**
1

**Class style**
Seminar

**Course offered year/period**
2018 • Second semester

**Quota**
(Freshman) 12 (8)

**Target year**
Mainly 1st year students

**Eligible students**
For all majors

**Day/period**
Tue. 5

**Classroom**
Seminar room 22, ILAS Bldg.

**Language**
English

**Keyword**
Food / Cuisine / Nutrition

**Outline and Purpose of the Course**
This course surveys the contemporary transformation of food, nutrition, and agriculture in East and Southeast Asia. The content of the course will be both familiar and challenging as we will cover the development of national cuisines, the role of farmers, and the evolution of diet in modern society. The perspective will be both practical (How does society gather and eat?) and theoretical (Why food systems developed the way they did).

**Course Goals**
Students will gain a foundation in ‘Food Studies’: how scientists understand and analyze global food trends from multiple perspectives. Students will also test their skills in an applied way by analyzing specific cuisines in East Asia and providing their own insight and analysis.

**Course Schedule and Contents**

1. The new worldwide passion for food
2. Rice food systems of Southeast Asia
3. Wheat food systems of East Asia
4. Rice-based vs. Wheat-based civilizations

Module 2: Food systems and cuisine
5. Rural food, urban cuisine
6. Development of national cuisine
7. Changing tastes and preferences of regional cuisine

Module 3: Food skills and food knowledge
8. Food education and childhood
9. Food and lifestyle
10. Taste, smell, chew: sensory skills of eating

Module 4: Student Presentations (order selected later)
11. Cuisine of Korea
12. Cuisine of Vietnam
13. Cuisine of Malaysia

**Class requirement**
English proficiency suitable for understanding lectures, reading basic texts, and participating in class discussion.

**Method, Point of view, and Attainment levels of Evaluation**
- 20% Attendance and mini-essay assignments (* More than 4 absences without official excuse loses this grade)
- 20% In-class discussion and participation
- 20% Final exam OR essay (student vote)
- 40% Final group presentation

**Textbook**
Not used
No textbook, but consultation of in-class materials and eBooks available at Kyoto University Library (see Reference book).

**Reference book, etc.**
- Van Esterik, Penny (Food Culture in Southeast Asia) (Greenwood) ISBN: 9780313344190 (eBook available from instructor)

**Regarding studies out of class (preparation and review)**
Students will be expected to do readings in preparation for class and discuss them the following week. Alternatively, students will conduct take home practical exercises which must be submitted the following week. Students should be prepared to discuss the topic of the week in an active manner during class.

**Others (office hour, etc.)**
Short meetings can be spontaneous or scheduled. Longer meetings scheduled only by email.
This is an introductory seminar on Japanese and European consumer law. The course is organized into the following three parts:

1) Brief overview of the history and development of Japanese and European consumer law,
2) Description of Japanese consumer law,
3) Presentation of the current state of European consumer law.

Along the way, relevant cases decided by Japanese courts and by the Court of Justice of the European Union will also be discussed.

The goal of this course is for students to acquire a basic knowledge of the structure and content of Japanese and European consumer law, and learn about the similarities and differences between these laws. An additional goal is for students to get familiar with comparative law and its methods.

During this course, students will be given the opportunity to actively participate in discussions and exchange of ideas.

**[Course Goals]**
- Acquiring a basic knowledge of the structure and content of Japanese and European consumer law.
- Learning about the similarities and differences between Japanese and European consumer law.
- Getting familiar with comparative law and its methods.
- Improving presentation and communication skills in English.

**[Course Schedule and Contents]]**

1. General introduction
2. Characteristics of consumer law
3. History and development of Japanese consumer law
4. History and development of European consumer law

Part two: Consumer protection in Japan
5. Product liability
6. Unfair terms in consumer contracts
7. Undue influence in consumer contracts
8. Money lending and interest rate restriction
9. Door-to-door sales and mail order sales

Part three: Consumer protection in the EU
10. Liability for defective products
11. Unfair terms in consumer contracts
12. Unfair commercial practices
13. Consumer credit
15. Conclusions

**[Class requirement]**
Students must be willing to talk in class, engage with other students and write a report paper in English.

**[Method, Point of view, and Attainment levels of Evaluation]**
No written examinations will be conducted.
Class attendance and participation: 60%
Oral presentation: 15%
Submission of report paper: 25%

**[Textbook]**
Instructed during class

**[Reference book, etc.]**
- Reference book
  Introduced during class

**[Regarding studies out of class (preparation and review)]**
- Students are expected to review the content covered in the previous class.
- Students are also recommended to briefly preview the content of the next class. More detailed instructions will be provided in class.

**[Others (office hour, etc.)]**
Students will be required to actively participate and express their thoughts in English during the classes.
Further, students will be assigned one oral presentation (of around 10 minutes, individual or in group, depending on the number of students) in part two or three.
A paper of the presentation (around 2 pages sized A4 / around 800 words) shall be submitted at the end of the course.
ILAS Seminar-E2 : Introduction to cross-cultural communication

**Course title:** ILAS Seminar-E2 : Introduction to cross-cultural communication

**Affiliated department, Job title, Name:** Disaster Prevention Research Institute Senior Lecturer, LAHOURNAT, Florence

**Group**
- Seminars in Liberal Arts and Sciences

**Course style**
- Seminar

**Number of credits**
- 2

**Number of weekly time blocks**
- 1

**Target year**
- Mainly 1st year students

**Eligible students**
- For all majors

**Day/period**
- Tue. 5

**Classroom**
- 22, Yoshida-South Campus Bldg. No. 1

**Language**
- English

**Keyword**
- Cross-cultural communication / culture / cultural competence

**Outline and Purpose of the Course**
This seminar is designed as an introduction to cross-cultural communication and aims at providing a working level of cross-cultural competence. With an emphasis on approaching and understanding other cultures and communication without bias, it will cover basic concepts and principles necessary for the promoting and improving of cultural self-awareness and inter-group, cross-cultural communication.

With the basic question of what culture is as a starting point, we will explore the mechanisms of culture and inter-group relationships and their implications in our perceptions of ourselves and others along the following themes: cultural awareness, cultural identity, ethnocentrism and cultural relativism, stereotype and prejudice, and cultural competence.

**Course Goals**
The objectives of this seminar are for students to:
- Gain an understanding and good command of the basic notions related to culture and cross-cultural communication.
- Acquire awareness and understanding of cultural processes (including our own preconceptions), the dynamic aspect of cross-cultural adaptation, and the impact of culture on communication.
- Become comfortable formulating ideas and opinions, and engaging in discussions on specific topics.

**Course Schedule and Contents**
This is a seminar-type class. Each session will start with a short lecture and rely mostly on discussion and group work based on this week's topic and readings.

1- Orientation and overview
2- Introduction to the notion of culture
3- Social and cultural identities
4- Culture and worldviews
5- Bias, stereotype, prejudices
6- Models of culture (P. 1)
7- Models of culture (P. 2)
8- Group work/presentation
9- Languages and culture
10- Nonverbal communication
11- Culturalshock
12- Towards cultural competence (P. 1)
13- Towards cultural competence (P. 2)
14- Final presentations

Note: this schedule may be subject to change. The detailed definitive schedule will be handed out during the first class.

**Class Requirement**
There are no specific requirements for taking this seminar. However, students must be willing to prepare each session by completing the weekly readings and assigned tasks, and to participate actively in class.

**Method, Point of View, and Attainment Levels of Evaluation**
Evaluation will be based on class attendance and active participation (60%), a group work (20%) and final presentation (20%). Active participation means actively listening and engaging with the class content, participating during discussions and group work, and contributing to the class by sharing opinions, experiences and reflections. It also means taking notes and reviewing them each week, since each class will start with a quick recap of the previous week done by a student.
Students absent 3 times or more will fail this class. Tardiness (by 15 minutes or more) will be treated as absence. Systematic tardiness and/or unexplained early departures will greatly reduce your attendance and participation grade.

**Textbook**
There is no textbook for this seminar. Weekly readings will be available for download. Printing and preparing the material is the responsibility of the student.

**Reference book, etc.**
- Introduced during class
- This is a seminar-type class, and as such will rely heavily on in-class discussion and student participation. It will be conducted in English. All readings and material will also be in English.
- As stated in the evaluation section, students are expected to engage actively during class. The level of engagement will greatly influence the final grade.
- Office hour is after class or by appointment.
[Outline and Purpose of the Course]

It is well recognized that physical forces play significant roles in our body, including in making our bones strong enough to make us walk every day. Centered on group discussions, this seminar will focus on helping students make a connection between physics and biology (a connection often lost to many) by looking into the role of physical factors (mechanical forces, stress, strain) in biological phenomena such as functioning of the heart, cell migration, bone remodeling, etc. First, a simplified introduction of the biological phenomenon in question will be given, followed by identification of the physical factors involved, and finally, discussions on their contributions. Discussions will center on how to measure the physical factors and how such data can be used for clinical diagnosis or treatment.

[Course Goals]

The ultimate goal will be to foster understanding of interconnectivity among different science disciplines and nurture students’ capability to formulate a multidisciplinary-based approach to solving a problem.

[Course Schedule and Contents]

Discussions in this seminar will be based on, but not limited to, the following broad topics. Students will be free to suggest a topic of interest and, if accepted by everyone, that topic will be included in the discussion.

1) Structure of the cell (2 weeks)
   What makes cells in our body so unique is that they are both building blocks as well as factories producing thousands of products in the name of proteins, DNA, etc. This topic will address the fundamental structures of a cell and how cells acquire structural uniqueness.

2) Mechanical interaction between cells and their physical environment (2 weeks)
   Cells in our body live and work in an environment constantly subjected to physical forces arising from blood flow, heartbeat, breathing motion, etc. In this seminar we will broadly look at how cells sense and respond to such forces, and the importance of this to health and diseases.

3) Biophysical landscape of cell migration (2 weeks)
   Cancer cells can move from one part of the body to another in a process known as metastasis. This property of cells to migrate is realized through complex process that involve structural remodelling of intracellular structures (actin cytoskeleton etc). Cell movement is physical in nature, but does it obey Newton’s law of motion? This discussion will delve into how cells move and why they do so.

4) Role of forces in bone remodeling (3 weeks)
   Why do astronauts lose their ability to walk after staying in space for an extended period of time? In this series of discussions, we will look into the role of forces in the making and breaking of our bones in an attempt to understand mechanisms behind these phenomena.

5) Engineering approaches to controlling cell behavior (2 weeks)
   We will discuss different techniques such as micropatterning that are being applied to control cell migration and/or to gain insights into the mechanisms of many important biological phenomena such as cell cycle and DNA synthesis.

6) Biofabrication to tissue engineering (2 weeks)
   In this lecture, we look at how cell adhesion can be controlled to enable fabrication of different cellular materials for application to regenerative medicine.

7) Review and closing discussions (2 weeks)

[Class requirement]

None

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

Class Presence / Participation 10%, Homework 15%, Midterm Report 25%, Final Report 35%, Final Presentation: 15%

[Textbook]

Not used

[Reference book, etc.]

1) Reference book
   ‹Reference book›
   OKEYO, Kennedy Omondi, MIYOSHI, Hiromi, ADACHI, Taiji 『Innovative Approaches to Cell Biomechanics-From Cell Migration to On-Chip Manipulation』 (Springer) ISBN:978-4-431-55163-8

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

Reading journal papers, books and other materials on biomechanics and biophysics is recommended. The seminar will be discussion-based, so prior preparation by way of reading about the above topics will be helpful in making the discussions lively.

[Others (office hour, etc.)]

Office hours will be announced separately during class hours. However, you are free to contact me by email anytime.
<table>
<thead>
<tr>
<th><strong>Course title</strong>&lt;br&gt;<em><strong>English</strong></em></th>
<th>ILAS Seminar-E2 : Let's simulate human movement (コンピューターで人を動かしてみよう)</th>
<th><strong>Graduate School of Medicine</strong>&lt;br&gt;Program-Specific Associate Professor PATAKY, Todd</th>
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<tr>
<td><strong>Affiliated department,</strong>&lt;br&gt;<strong>Job title,</strong>&lt;br&gt;<strong>Name</strong></td>
<td>Seminars in Liberal Arts and Sciences</td>
<td>Graduate School of Medicine Program-Specific Associate Professor PATAKY, Todd</td>
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<td>Seminar</td>
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<td><strong>Course offered year/period</strong></td>
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<td><strong>Quota (Freshman)</strong></td>
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<td><strong>Target year</strong></td>
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<tr>
<td><strong>Eligible students</strong></td>
<td>For all majors</td>
</tr>
<tr>
<td><strong>Day/period</strong></td>
<td>Thu.5</td>
</tr>
<tr>
<td><strong>Classroom</strong></td>
<td>482, 4F, School of Human Health Sciences, Faculty of Medicine / Faculty of Medicine/Pharmaceutical Science Campus/University Hospital Campus</td>
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<td><strong>Language</strong></td>
<td>English</td>
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**Keyword**
- computer simulation /
- physics /
- biomechanics

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

Computer simulations of human movement help (a) clinicians understand movement disorders, (b) doctors make corrective surgery decisions, and (c) engineers design artificial limbs. This course will introduce you to human movement simulation, ranging from simple 1D motion to 3D, multi-segment muscle-driven motion. We will use the free physics simulator "OpenSim" to explore simulation possibilities and the various factors which affect simulation results. Computer programming experience is useful but not required.

**[Course Goals]**

Students will become familiar with the main concepts of human motion simulation. They will learn how to reproduce example models and animations. Last, as a final project they will work to produce their own human movement simulation from start-to-finish.

**[Course Schedule and Contents]**

Over this 14-week lecture the following topics will be covered in each class:

1) Introduction I: Simulations in OpenSim
2) Introduction II: Musculoskeletal Modeling
3) Simulating surgery I: Basics
4) Simulating surgery II: Analysis
5) Inverse Kinematics I: Basics
6) Inverse Kinematics II: Scaling
7) Sports movements I: Basics
8) Sports movements II: Soccer kick
9) Injury Prevention I: Basics
10) Injury Prevention II: Ankle injury
11) Dynamic Walking I: Basics
12) Dynamic Walking II: Stability
13) Static Optimization I: Basics
14) Static Optimization II: Optimum Muscle Activation

**[Class requirement]**

None

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

Students are expected to actively participate in class, to reproduce all examples discussed in class, and also to produce all simulations independently. Evaluation will be based on the following criteria: class participation (16%), assignments (84%: 14 assignments @ 6% each).

**[Textbook]**

None. All necessary materials will be distributed electronically and will be discussed in class.

**[Reference book, etc.]**

Introduced during class

**[Related URL]**

http://opensim.stanford.edu (The OpenSim software package will be used in all lectures.)
https://simtk-confluence.stanford.edu/display/OpenSim/OpenSim+Documentation (OpenSim documentation)

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

There will be a small assignment each week based on lecture content; students should submit these assignments more than one day before the next lecture.

**[Others (office hour, etc.)]**

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Lecture code: Z002070
### ILAS Seminar-E2: Introduction to robotics - a practical approach

**Affiliated department, Job title, Name**
Senior Lecturer, PHEILAMORE, Hemma

<table>
<thead>
<tr>
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<th>Number of credits</th>
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<tr>
<td>Seminars in Liberal Arts and Sciences</td>
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<td>1</td>
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</tbody>
</table>

**Class style**
Seminar

**Course offered year/period**
2018 • Second semester

**Quota (Freshman)**
15 (8)

**Target year**
Mainly 1st year students

**Eligible students**
For all majors

**Day/period**
Mon., 5

**Classroom**
04, Yoshida-South Campus Academic Center Bldg. West Wing

**Language**
English

**Keyword**
Robotics

### Outline and Purpose of the Course

Robotics is a rapidly growing, diverse and exciting field of engineering. The development of robots and automation is revolutionising current technology in areas including medicine, transport and manufacturing. The seminars will deliver taught material on core aspects of robotics including motion, sensing, control and communication, and the interfaces that link these systems. Students will reinforce their understanding of taught material through weekly in-class practical activities using wheeled mobile robots.

### Course Goals
- To obtain a strongly connected theoretical and practical understanding of the foundations of the core principles of robotics.
- To develop broadly applicable practical laboratory skills including experimental setup, documentation and group work.

### Course Schedule and Contents

The provisional schedule for the course is as follows. However, the order or time allocated to each theme is subject to change depending on the class size and students’ background understanding, progress and proficiency for the subject matter. Students will be notified of changes to the schedule in advance to give adequate time to prepare for forthcoming seminars.

1. Introduction (1 week)
2. Wheeled robot motion (1 week)
3. Robot programming basics (1 week)
4. Internal Sensing and odometry (1 week)
5. Calibrating robot hardware (1 week)
6. Sensing and Control: Sensing the environment (1 week)
7. Sensing and Control: PID control (1 week)
8. Sensing and Control: Collision avoidance (1 week)
9. Introduction to algorithms: Solving problems (1 week)
10. Introduction to algorithms: Behaviour (1 week)
11. Communication and Interfaces: Part 1 (1 week)
12. Communication and Interfaces: Part 2 (1 week)
13. Autonomy and user-interaction (1 week)

### Class requirement
None

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

2 x coursework assignment (50% each)

Each assignment will comprise:
- Practical in-class experiment (week 8, week 12) [group work]
- Written report produced for homework. [individual work]

Week 15 is assigned for finishing any practical experimental work required to complete the coursework assignments.

### Textbook
Instructed during class

### Reference book, etc.
Introduced during class

### Regarding studies out of class (preparation and review)
More detailed instructions will be provided in class.

### Others (office hour, etc.)

Lecture code: Z002062

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[Image of wheeled mobile robot]
Outline and Purpose of the Course

“Smart Technology” refers to products and their component materials that monitor and intelligently respond to our lifestyles and behavior. The emergence of “Smart Technology” has led to a growth in research on wearable technology. Electrical technology worn on the body is advancing areas from medical devices to fashion design and consumer electronics. This course will cover several technical aspects of wearable technology through practical seminars that introduce students to basic microcontroller programming, electronics and design using smart materials for wearable devices. Students will work in groups to investigate the potential benefits and associated challenges of on-body electronic devices through a series of guided experiments.

Course Goals

- To understand the basic of the engineering behind a number of wearable electronic technologies.
- To obtain a strongly connected theoretical and practical understanding of the technologies investigated.
- To be able to consider and discuss social and ethical impacts surrounding the use of the technology investigated.
- To develop broadly applicable practical laboratory skills including experimental setup, documentation and group work.

Course Schedule and Contents

The provisional schedule for the course is as follows. However, the order and time allocated to each theme is subject to change depending on the class size and students’ background understanding, progress and proficiency for the subject matter. Students will be notified of changes to the schedule in advance to give adequate time to prepare for forthcoming seminars.

1. Introduction to wearable technology: course overview (1 week)
2. Introduction to Arduino programming (1 week)
3. Simple wearable electronic circuits (1 week)
4. Introduction to smart materials (1 week)
5. On-body energy generation (2 weeks)
6. On-body sensors (3 weeks)
   - Embedded sensors: Speed and orientation using IMU
   - Integrated sensors: Design using smart materials
7. On-body actuators (2 weeks)

Coursework assessment

- Design assignment using smart materials (Week 9)
- In-class experiment and homework lab report. Topic: On-body communication and interfaces (Week 13)

Textbook

Instructed during class.

Reference Book

Introduced during class.

Regarding studies out of class (preparation and review)

More detailed instructions will be provided in class.

Class Requirement

No requirement.

Method, Point of view, and Attainment levels of Evaluation

2 x coursework assignment (50% each):
- Week 9: Design project using smart materials
- Week 13: In-class experiment and homework lab report. Topic: On-body communication and interfaces

Examination (1 week)

Feedback session (1 week).

Lecture code: Z002063
Course title
ILAS Seminar-E2 : Critical thinking and Communication skills

Affiliated department, Job title, Name
Graduate School of Medicine
Assistant Professor, POUDYAL, Hemant

Group
Seminars in Liberal Arts and Sciences

Number of credits
2

Number of weekly time blocks
1

Class style
Seminar

Course offered year/period
2018 • Second semester

Quota (Freshman)
15 (10)

Target year
Mainly 1st year students

Eligible students
For all majors

Day/period
Thu. 5

Classroom
Seminar room 24, ILAS Bldg.

Language
English

Keyword
Critical thinking / Communication / Academic writing

[Outline and Purpose of the Course]
This course presents an introduction to theory and practice of communication skills necessary for undergraduate students for the academic and scientific scholarship. The course will adopt the format of a “short-term research project” where students will be required to generate ideas around a topic of their choice through self-directed learning and in-class discussion. This unique approach will help students to build knowledge, vocabulary and critical thinking skills that will enable them to develop ideas effectively communicate in English. Students will then have the opportunity to write short articles, provide peer feedback and present their paper in the classroom. The course will include lectures on presentation skills, organizing scientific information, principles of good writing, strategies for writing faster and with less anxiety, types and format of biomedical articles, and other skills necessary to effectively communicate with different audiences.

[Course Goals]
1. To define and describe the process of academic communication
2. To familiarize with the process of simple scientific enquiry, reasoning and critical thinking
3. To comprehend and adapt styles of written and oral communication including a systematic approach to drafting, revising and editing, and the development of logical, clear, concise, balanced arguments
4. To develop cultural literacy skills by exploring principles of non-verbal communication and a range of strategies designed to overcome barriers to communication

[Course Schedule and Contents]
In principle, the course will be offered as the following plan. However, it may change the order or the number of times for each theme depending on the progressive of the course or handling on current topics.
1. Course introduction
2. Organising thoughts and ideas
3. Scientific methods, reasoning and hypothesis formation
4. Critical thinking: Developing inferences skills
5. Critical thinking: Examining opinions and beliefs
6. Evaluating and assessing scientific evidence
7. The communication process and cultural literacy
8. Writing academic communications
9. Academic speaking strategies
10. One-to-one talk
11. Large group talk-Making academic presentations
12. Verbal & nonverbal communication skills

Lecture code: Z002045
ILAS Seminar-E2 : Health Research Methodology - Introduction to Socio-epidemiology

Graduate School of Medicine
Senior Lecturer: S. Pilar Suguimoto

Seminars in Liberal Arts and Sciences

Number of credits: 2
Number of weekly time blocks: 1

Class style: Seminar
Course offered year/period: 2018 • Second semester
Quota (Freshman): 12 (6)

Target year: Mainly 1st year students
Eligible students: For all majors
Day/period: Wed.5

Classroom: Small seminar room, 1F, Science Frontier Laboratory, Faculty of Medicine (Faculty of Medicine/Pharmaceutical Science Campus/University Hospital Campus)

Language: English

Keyword: Research Methodology / questionnaire / interview / qualitative / social marketing

Outline and Purpose of the Course
This course provides an introduction to research methods relevant to the health sciences. It will introduce students with concepts of Socio-epidemiology, a new public health discipline first established in Kyoto University School of Public Health in 2000. Socio-epidemiology builds on epidemiology and social sciences, or quantitative and qualitative research methods to facilitate an ecological or socio-cultural understanding of health using a multidisciplinary approach.

Course Goals
* To understand key concepts in research methods
* To understand the importance of social marketing in behavioral prevention
* To understand the strengths and limitations of qualitative and quantitative studies
* To understand the development of questionnaires
* To understand the development of qualitative interviews

Course Schedule and Contents
1. The scientific method, research process, research question
2. Ethics in research, literature review, research proposal
3. Research design and methods, measurement instruments
4. Sampling, What is socio-epidemiology?, Social and behavioral theories
5. Social marketing (1): Formative research and Price
6. Social marketing (2): Product and Place
7. Social marketing (3): Promotion
8. Quantitative method (1): questionnaire development
9. Quantitative method (2): questionnaire development
10. Quantitative method (3): questionnaire development
11. Qualitative method (1): interview development
12. Qualitative method (2): interview development
13. Qualitative method (3): interview development
14. Practicum

Method, Point of view, and Attainment levels of Evaluation
The course is presented in lecture/discussion format and may include videos or guest speakers.

Grading will be based on active participation and assignments (40%), and final project (60%).

Textbook
Not used

Reference book, etc.
* Introduce during class
  The course may use chapters from textbooks and readings from academic literature. Students will be provided with a list of recommended readings for each topic in due time.

Regarding studies out of class (preparation and review)
* Students are expected to come to class having completed the assigned reading and writings, and ready to contribute to discussions.

Others (office hour, etc.)
Seminars will be held at:
Science Frontier Laboratory, Faculty of Medicine Campus.
Small seminar room (1F).

Please visit KULASIS to find out about office hours.

Lecture code: Z002030
## [Outline and Purpose of the Course]

Chemistry is all about electrons, atoms, and molecules, and their shapes, movements, and electronic behavior. However, even big biological molecules are much too small for us to see or even imagine. In this seminar, we learn how to study structures, behavior, and properties of molecules with the help of light. We will get to know the wide range of light and how different light reveals different aspects of molecules. Students with any major are welcome.

## [Course Goals]

Students will build up on their knowledge of atoms, molecules, and their properties as well as electromagnetic radiation to understand the basics of spectroscopic methods, their purpose, and application. They will get to know how different properties of molecules can be studied with spectroscopy, and how this connects to chemistry and physics. At the same time, the ability to discuss about spectroscopic experiments in natural sciences in English will be developed.

## [Course Schedule and Contents]

The course will work through fundamentals and methods of spectroscopy, which include the following topics. This seminar is held in a causal and interactive way. Students can influence the selection of topics based on their interest. The plan below is not strict and rather serves as a guideline.

1. Introduction - What is light and how to use it? (4 weeks)
   - We will learn about this strange phenomenon called "light" and get to know light’s behavior when interacting with matter.
2. Bending the rainbow (3 weeks)
   - We look at the basics for spectroscopy such as the different properties of electromagnetic radiation, spectroscopic devices and the general idea behind the interaction of light with molecules and atoms.
3. Dancing molecules (3 weeks)
   - We learn how light induces molecular vibration and rotation, and what this tells us about the shape and properties of molecules.
4. How to make electrons jump (4 weeks)
   - We go over to electronic transitions and their usefulness for chemical identification.

Depending on the available time and interest of the students, we may also discuss other spectroscopic methods, the operation principles of spectroscopic devices, or theoretical concepts of spectroscopy.

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Lecture code: Z002013
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<th>Course title</th>
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<tr>
<td>Institute for Frontier Life and Medical Sciences (プログラム: 前沿生命科学大学) Program-Specific Seminar VANDENBON, Alexis</td>
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<td>For all majors</td>
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<td>Target year</td>
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<td>Classroom</td>
<td>South Research Bldg. No.1 Institute for Frontier Life and Medical Sciences (Bldg. No.1 Rm.119(Seminar Room) (Faculty of Medicine/Pharmaceutical Science Campus/University Hospital Campus)</td>
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<tr>
<td>Keyword</td>
<td>Bioinformatics / Computational biology / Sequence alignment / Evolution / Genomics</td>
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**Outline and Purpose of the Course**

Bioinformatics is an interdisciplinary field in which statistics, machine learning and computer programming are applied to biological data. Recently, computational approaches such as bioinformatics have become an essential part of biological research. This course will offer an overview of bioinformatics techniques, including sequence alignment, comparative and evolutionary genomics, protein structure prediction, analysis of NGS and GWAS data, systems biology, and widely used biological databases.

**Course Goals**

Students will gain insight into a variety of topics within the field of bioinformatics. By taking this course, students will acquire knowledge about fundamental bioinformatics analyses, and will gain understanding about how bioinformatics can contribute to studies in biology.

**Course Schedule and Contents**

In principle, the course will be offered according to the following plan. However, depending on the progress of the course the order or the number of lectures for each topic may change.

1. Introduction to Bioinformatics: What is bioinformatics? We will introduce various topics in bioinformatics, from the use of sequence alignments in making phylogenetic trees, prediction of protein structure, to the modelling of a simple regulatory network.
2. Genome organization and evolution. We will introduce genomes and the structures they contain. Genome sequencing projects and bioinformatics methods for genome assembly and gene prediction will be introduced.
3. Databases: Databases form the basis for most applications in bioinformatics, containing sequences, structures, annotations, pathways, etc. We will go through the most widely used biological databases, and look at the types of data and tools they contain.
4. Alignments: Aligning sequences is one of the fundamental tasks in bioinformatics. We will start with an introduction to alignment, from dotplots to a dynamic programming algorithm. The usage and interpretation of pairwise sequence alignments will be covered.
5. Phylogenetics: We will extend pairwise alignments to alignments of multiple sequences. We will introduce methods for turning multiple alignments into phylogenetic trees. We will discuss different types of phylogenetic trees, their properties and interpretation.
6. BLAST and high-throughput sequencing alignment: Introduction to BLAST, its variations and usages. Introduction to high-throughput sequencing and alignment approaches designed for aligning large amounts of short genomic sequencing reads.
7. Practical NGS data analysis: Introduction to so-called next generation sequencing (NGS) approaches, and its applications. The information contained in a typical NGS dataset will be introduced, as well as practical steps in its processing, mapping, and interpretation.
8. Proteome bioinformatics: We will introduce protein structural alignments and approaches for predicting secondary, tertiary and quaternary protein structure from amino acid sequences. In addition, we will briefly cover methods for predicting protein function.
9. Interaction proteomics and protein networks: We will discuss different types of protein-protein interactions, and approaches for predicting them. Databases and approaches for analysing large-scale protein-protein interactions data (networks) will be introduced.
10. Regulatory sequence analysis. After a brief overview of the regulation of gene expression, we will discuss bioinformatics methods for predicting regulatory motifs in DNA sequences, focusing on transcription factor binding motifs and miRNAs.
11. RNA secondary structure prediction. We will introduce features of RNA molecules. Several approaches for predicting RNA secondary structures will be covered, ranging from simple scanning methods for finding stem-loop motifs, to complex energy-based approaches.
12. Systems biology: Complex systems have properties that cannot easily be inferred from their individual components. In this lecture, we will introduce holistic approaches to the study of biology. Especially, we will focus on biological networks and their properties.
13. Genome-wide association studies (GWAS): After a brief introduction of GWAS, we will discuss bioinformatics steps in GWAS analysis, and methods for finding associations between single-nucleotide polymorphisms (SNPs) and diseases and other traits.
14. Review of course material.
15. Final examination
16. Feedback

**Class requirement**

Students are expected to have basic knowledge about molecular biology.

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

Grading: attendance and active participation (20%), mid-term exam (20%), quizzes/assignment (20%), and final exam (40%)

**Textbook**


The course lectures will follow the content of this textbook. Sections of the book to read in preparation of each class will be announced.

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

The course will follow a textbook. At the end of each lecture I will specify the sections to read before the next lecture.

**Others (office hour, etc.)**

No fixed office hours. Students are requested to make appointments directly or by email.
[Outline and Purpose of the Course]
This course introduces students to the basic principles that address mechanism, solution and management of climate-soil-water disasters. The course covers analysis, prediction, assessment and monitoring of geo-disasters. For example: disasters from earthquake and heavy rain such as landslide, slope failure, debris flow, ground subsidence, and liquefaction. Roles of forests and relevant information communication technology (ICT) tools and risk reduction methods are discussed.

[Course Goals]
1. To introduce students with knowledge, concept and terminology on disasters and methods of prevention.
2. To encourage students' technical discussion and presentation on geo-disasters prevention and risk reduction.
3. To facilitate students in finding innovation and solution for geo-disasters prevention and risk reduction.

[Course Schedule and Contents]
1. Introduction
2.-4. Disaster assessment
   - Rainfall, landslide and slope failure
   - Rock fall and debris flow
   - Soil erosion
5.-7. Disaster assessment
   - Ground subsidence
   - Liquefaction
   - Landslide and slope failure
   - Tsunami
8. Student's Presentation (1)
9.-12. Prevention and mitigation
   - Landslide, slope failure, debris flow
   - Sabo dams
13. Student's Presentation (2)
14.-15. Risk reduction and management
   - Information, Communication, and Technology (ICT) tools
16. Feedback

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Class participation (25%), attendance (25%), assignment report (25%) and oral presentation (25%)

[Textbook]
Reading materials and handouts will be distributed.

[Reference book, etc.]
(Reference book)
Introduced during class
To be announced during classes.

[Regarding studies out of class (preparation and review)]
Students are expected to be independent in finding online resources to attain relevant issues of discussion during seminar to enhance student interaction and understanding during classes.

[Others (office hour, etc.)]
After class, student consultation will be arranged with prior notice.
## [Outline and Purpose of the Course]

In order to take this seminar, it is recommended to have some knowledge of biology or biochemistry or take the lecture [Introduction to biochemistry] at the same time.

The content of the seminar is the same as that of the lecture. The difference is that, here we will take time to review and discuss the contents of the lecture. I will answer questions to make sure every student could understand everything they wanted to understand. This means that this seminar is a tutorial to the lecture. The Japanese subtitle  vận đỏ emphases this.

Students are welcome to ask any question at any time. We will also solve textbook problems to deepen our understanding of the matter.

This seminar is given in English and active student participation is highly encouraged.

## [Course Goals]

As all matter is composed of atoms, modern life science aims to explain all aspects of life comprehensively from the atomic level to that of the entire organism. In this seminar, students will attain a profound understanding of the atomic design of life, that is how biomolecules work and join forces to fulfill virtually all actions exerted by living beings.

## [Course Schedule and Contents]

1. Introduction to biochemistry
2. DNA, genes, and genomes
3. DNA replication and gene expression
4. Proteins
5. Protein structure
6. DNA isolation and analysis
7. DNA cloning and PCR
8. Protein methods
9. Enzymes
10. Enzyme kinetics
11. Carbohydrates
12. Lipids
13. Metabolism
14. Citric acid cycle and oxidative phosphorylation
**[Outline and Purpose of the Course]**

In order to take this seminar, it is recommended to have some knowledge of biology or biochemistry or take the lecture [Introduction to biochemistry] at the same time.

The content of the seminar is the same as that of the lecture. The difference is that, here we will take time to review and discuss the contents of the lecture. I will answer questions to make sure every student could understand everything they wanted to understand. This means that this seminar is a tutorial to the lecture. The Japanese subtitle 生化学の助 結合 this.

Students are welcome to ask any question at any time. We will also solve textbook problems to deepen our understanding of the matter.

This seminar is given in English and active student participation is highly encouraged.

**[Course Goals]**

As all matter is composed of atoms, modern life science aims to explain all aspects of life comprehensively from the atomic level to that of the entire organism. In this seminar, students will attain a profound understanding of the atomic design of life, that is how biomolecules work and join forces to fulfill virtually all actions exerted by living beings.

**[Course Schedule and Contents]**

1. Introduction to biochemistry
2. DNA, genes, and genomes
3. DNA replication and gene expression
4. Proteins
5. Protein structure
6. DNA isolation and analysis
7. DNA cloning and PCR
8. Protein methods
9. Enzymes
10. Enzyme kinetics
11. Carbohydrates
12. Lipids
13. Metabolism
14. Citric acid cycle and oxidative phosphorylation
This is a small-sized seminar-type class for students anticipating to learn how the ecosystem is functioning, what kind of services the ecosystem can provide to mankind and how to maintain our Earth's sustainability. This course comprises two main themes: 1. threats to ecosystem sustainability. 2. insects as keystone species for ecosystem sustainability. In the 1st half, several concurrent threats to ecosystem sustainability including overpopulation, biodiversity loss, habitat degradation and global change will be discussed. The 2nd theme will detail the role of insects in maintaining ecosystem sustainability, such as those for nutrition cycling or pollination.

Students will be assigned to read a short, simple paper every week (relevant to the topic of the lecture next week). Students then are asked to come up with at least three questions of interest and send the questions to the lecturer at least one day prior to the lecture.

Most of the course content is case-driven, the students shall not worry about not having a relevant academic background, especially for those from the non-biology department.

The course will help the student understand we human beings are not the only species in the ecosystem, and there are more species (especially insects) out there doing their job to maintain the sustainability of different ecosystems. Also, students can get to know that we human beings sometimes are the major destroying force of ecosystem sustainability as well as costs we have to pay if neglecting warnings from our planet.

The course schedule and contents:

- **Week 01**: Course introduction
- **Week 02**: What is ecosystem sustainability?
- **Week 03**: What is ecosystem service?
- **Week 04**: Threats to ecosystem sustainability: Overpopulation
- **Week 05**: Threats to ecosystem sustainability: Biodiversity loss
- **Week 06**: Threats to ecosystem sustainability: Habitat degradation
- **Week 07**: Threats to ecosystem sustainability: Global change
- **Week 08**: Insect as keystone species for ecosystem sustainability
- **Week 09**: The role of insect pollinators in maintaining ecosystem sustainability
- **Week 10**: The role of insect decomposers in maintaining ecosystem sustainability
- **Week 11**: How social insects maintain ecosystem sustainability
- **Week 12**: Pest management and ecosystem sustainability
- **Week 13**: Student oral presentation 01
- **Week 14**: Student oral presentation 02
- **Week 15**: Finals
- **Week 16**: Feedback

**Class requirement**

None

**Textbook**

WJ Mitsch, SE Jørgensen (Ecological engineering and ecosystem restoration.) (John Wiley & Sons, 2003)

**Reference book, etc.**

(Reference book)

Introduced during class

to be announced according to the content of a given class each week

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

Students are encouraged to express their ideas in class based on the readings the instructor assigns ahead of the class.

**Others [office hour, etc.]**

Lecturer: Chin-Cheng Yang (ccyang@rish.kyoto-u.ac.jp)
Office: HW 412, Research Building No. 1, Uji Campus

Office hours: to be announced

Note: There is a possibility that the instructor may organize a field trip that normally is a one-day event on the weekend, instead of the regular slot of this lecture. The lecturer will discuss date and time with students for the field trip at the beginning of the semester. Students are advised to pay the travel expense. Also be advised to obtain the insurance for study and research "Personal Accident Insurance for Students Pursuing Ed. & Rsch. (学生教育研究灾害傷病保険)" if you decide to take the class.
Course title
ILAS Seminar-E2: Introduction to Computational Neuroscience

Affiliated department, Job title, Name
Graduate School of Medicine, Senior Lecturer, ZENAS C. CHAO

Group
Seminars in Liberal Arts and Sciences

Number of credits
2

Number of weekly time blocks
1

Class style
Seminar

Course offered year/period
2018 • Second semester

Quota (Freshman)
20 (15)

Target year
Mainly 1st year students

Eligible students
For all majors

Day/period
Thu. 5

Classroom
R.A, Yoshida-South Campus Academic Center Bldg. North Wing

Language
English

Keyword
Neuroscience / Data analysis / Artificial neural network / Programming / MATLAB

[Outline and Purpose of the Course]
Welcome to "Introduction to Computational Neuroscience"! How do neurons in our brain process information? How can the understanding of our brain help solving medical and engineering problems we’re facing today? In this hands-on course, students will learn to analyze real neural data and build artificial neural network models with MATLAB/Octave, and share their work through discussion and presentation. This class is for the student who is interested in computational neuroscience but fears computer programming. Students with no neuroscience and programming backgrounds are welcome.

[Course Goals]
(1) To learn neuroscience from a quantitative perspective.
(2) To work with real data and solve real world problems.
(3) To program in a popular programming language MATLAB/Octave.
(4) To share experience in discussion, writing, and presentation.

[Course Schedule and Contents]
(1) Introduction

PART I. Fundamentals
(2) Basic Neurobiology
(3) Programming: The Basics of MATLAB/Octave

PART II. Neural Coding
(4) Neural Coding - Spikes
(5) Programming - Spike Data Analysis
(6) Neural Coding - LFP, ECoG, & EEG
(7) Programming - LFP, ECoG, & EEG Data Analysis

(8) Midterm Discussion #1 - Design Project
(9) Midterm Discussion #2 - Paper Review

PART III. Neural Networks
(10) Neural Networks & Plasticity
(11) Artificial Neural Networks

[Class requirement]
None

[Method, Point of view, and Attainment levels of Evaluation]
Attendance & participation (~10%), programming assignments (~40%), midterm discussion (20%), final presentation (~30%).

[Textbook]
Not used

[Reference book, etc.]
Introduced during class

[Regarding studies out of class (preparation and review)]
Students will need to review the course material after each class, and be prepared to spend 1–2 hours per week on the assignments.

[Others (office hour, etc.)]
Programming exercises will be held in the media center, and students will have access to public PCs. Students are also encouraged to bring their own laptops.
Instructors

**ANAGNOSTOU, Despoina**
Associate Professor
Graduate School of Medicine

I recently joined Kyoto University as an associate professor at the Graduate School of Medicine. With a first degree in Nursing and clinical experience in various settings in Athens, Greece, I moved to the UK to enhance my knowledge. I completed an MSc in Advanced Nursing Practice form the University of Edinburgh, before obtaining my PhD from King's College London. I then worked as a researcher in the UK academia in the field of palliative care. My research interests include decision-making in palliative care, measuring quality of care, support systems for families and patients, and transcultural aspects of end-of-life care.

**Courses**
- Introduction to Basic Concepts of Health Psychology-E2 : Communication Issues and Decision-making in Patient Care (page 212)
- Cultural Aspects of Health Care-E2 (page 220)
- ILAS Seminar-E2: Clinical and ethical issues within palliative care: the European Context (page 238)
- ILAS Seminar-E2: Understanding and critical appraisal of qualitative research methods in health care (page 283)

**BADENOCH, Nathan**
Associate Professor
Graduate School of Letters

Originally from Philadelphia, I have spent most of my adult life studying and working in Asia, and currently conduct research on bicultural diversity in Southeast Asia, with a particular focus on the countries of Laos, Thailand and Myanmar. All of my education has been in interdisciplinary studies, so I try to bring broad and diverse, yet integrated perspectives to my teaching. I believe that in order to understand our globalized world, we need to develop big-picture theories of society that are rooted in a deep understanding of the local situations in which people live their lives. In my Human Geography and Intercultural Communication classes I work with a mix of general academic material, current social issues, student experiences, and my own observations from a diverse variety of field-sites.

**ANDERSON, James Russell**
Professor
Graduate School of Letters

As a comparative psychologist, I am interested in various aspects of social behavior, learning and cognition in humans and other species, especially non-human primates. In the social domain, topics I have studied include the influence of dominance status in the context of competitive feeding tests, and the effects of brief separations and social tension on social and self-grooming.

My studies in cognition have examined self-recognition and mirror image reactions in various primate species including humans, and tool-use by macaques and capuchin monkeys. Other work involved training primates to control and remember the expression of natural behaviors such as scratching, yawning, and facial expressions. I have also studied nonhuman primates’ and human children’s processing of nonverbal communicative signals; this work developed into studies of intentional communication (including deception) and understanding of third-party interactions. I am also interested in behavioral adaptations in natural environments, having conducted fieldwork on macaques, baboons, and chimpanzees. I also have a long-standing interest in environmental enrichment for zoo and laboratory-housed animals, having conducted and supervised studies of abnormal behaviors and the effects of providing inanimate objects, foraging substrates, and small swimming pools as enrichment for primates in captivity.

**BABER, William**
Associate Professor
Graduate School of Management

Will Baber, Ma. Ed. has combined education with business throughout his career. His work has included economic development in the State of Maryland, language services in the Washington, DC area, supporting business startups in Japan, and teaching business students in Japan and Europe. Currently he is at Kyoto University teaching and researching as an Associate Professor in the Graduate School of Management. In his career he has frequently encountered cross cultural conflicts and synergies. He studies cross-cultural adaptation and the impact of expatriates on the overseas workplace. A further area of study includes negotiation in intra and intercultural contexts.

**BAARS, Roger Cloud**
Senior Lecturer
Graduate School of Global Environmental Studies

James Russell ANDERSON

I am a Senior Lecturer at the Graduate School of Global Environmental Studies, Kyoto University. Originally from Hamburg (Germany), I have received my PhD in Human Geography from The University of Auckland, New Zealand. Before coming to Kyoto, I have held academic appointments at Goethe University Frankfurt (Germany) and The University of Auckland (New Zealand). I am interested in the relationships between social change and governance particularly as they relate to politically desired social orders, values and practices. My research agenda is organised along the three interrelated themes of spatial identity and belonging, social change and reproduction and new forms of affective environmental governance.

My courses on Human and Urban Geography are concerned with the spatial organisation and transformation of human life. We will examine how most global phenomena are intrinsically spatial and how a geographical lens allows us to understand these global processes in a more comprehensive way.
I obtained my first degree in Zoology from Victoria University of Wellington and my M.Sc. degree also in Zoology from the University of Canterbury in Christchurch, which are both in New Zealand. I then completed a Ph.D. in the United Kingdom at Newcastle University. Since completing my Ph.D., I have worked as a researcher and professor in many countries including the United States, Japan, New Zealand, and China. My current research interests include the evolution of apes, hybridization, and the adaptive significance of animal personalities, animal communication, the relations between animal behavior and their physiology, and life history evolution.

I teach four courses for the Institute of Liberal Arts and Sciences: (1) Introduction to Ecology, (2) Introduction to Evolution, (3) Methods in Ecology and Natural History (MENH), and (4) Introduction to Bird Study (Ornithology). I emphasize the importance of critical thinking, problem-solving, and team-work in my courses and many class exercises may incorporate these aspects. My overall aim is to design courses that are interesting and topical and also provide students with an opportunity to learn new skills.

Dr. Julius BAUTISTA, an Australian of Filipino descent, is Associate Professor at the Center for Southeast Asian Studies, Kyoto University. He has been teaching courses on world religion and Asian culture since 2015, and has also published several books and journal articles that focus on the political and cultural dynamics or religious beliefs, rituals and institutions.

I believe that our understanding of some of the world’s most crucial political and social problems is enhanced by a comparative examination of the world’s religions. This is the basic premise that guides my teaching. I invite you to join me in studying the fundamental principles of religion through its artistic depictions, the stories of its main protagonists and its ritual expressions, among other aspects of faith. We shall also explore some of the scientific and philosophical theories that have characterized the attempt to make sense of the human relationship with the divine, particularly in the Asian region. No prior knowledge of any religion or belief is required — just an open mind and a willingness to discuss religion-related issues without fear or prejudice.

My lectures cover electromagnetics, optics, and experimental physics. Having worked 10 years in industry and 5 years in academia, I can give my students a strong foundation in engineering together with a practical approach to problem-solving. I will share with you many experiences of applying scientific theories to solve engineering problems, and help you get ready for the “real-world” that awaits after graduation.

Marco grew up in Portugal and DR Congo and did his graduate studies in France, where he obtained his PhD from the University of Paris 7, under the supervision of Robin Fribourg who first described the human p53 isoform p53/47 (also known as delta40p53). Marco’s PhD research led to the discoveries of the Internal Ribosome Entry Site (IRES) and the RNA non-coding functions in p53 mRNA. During his postdoctoral training and in collaboration between the University of Paris 7 and Kyoto University where he teaches Human Genetics and Genetic Disease, Developmental Biology and iPS Cells and Biochemistry. His most recent research interests include investigating the role of hotspot synonymous mutations and m6A non-coding functions in cancer formation and development. For more information on Marco’s research and educational activities please visit: areap53.com

Message to students: Learning and teaching is reciprocal. Motivation comes from willingness to do something. Learning history is not about memorizing dates. These courses are aimed at instilling the ability to think critically, develop a historical consciousness to gain a better understanding of humanity, society, and contemporary politics. Students from diverse disciplines are encouraged to join.
Originally from the United States, I received my Ph.D. from the University of California at Berkeley, where I studied chromosomes and meiosis. I continued my studies as a researcher at UC San Francisco, where I began using advanced microscopy and image analysis tools that I still use daily in my own research. I came to Kyoto University in 2010 as a principal investigator in the Institute for Integrated Cell-Material Sciences, and now am located in the Graduate School of Biostudies.

The combination of biological and computational experimentation has become an essential part of modern research. My classes will introduce you to fascinating questions in diverse areas of biology. From both the "wet" side (how does a worm grow from an egg? how do our cells divide?) and the "dry" side (how can we use computers to design changes in DNA, or see objects smaller than light itself?), hands-on experience and opportunities to observe biology in action will be provided as much as possible.

I grew up in rural Arkansas in the heart of the Ozark mountains. While this was a great place to spend my childhood, it wasn’t until I was a freshman in college that I came into contact with people from other cultures and linguistic backgrounds. This experience prompted me to learn more about other languages, cultures, and religions. After spending three years in a Zen temple in Kyoto, I received my MA degree at Omnibus University in the field of Buddhist studies. Most of my work involved Sanskrit, an important Indo-European language of India, and I became interested in how Sanskrit fit into the larger historical context of the Indo-European language family. I later received my MA and PhD in Indo-European historical linguistics from Kyoto University. My current research focuses on the history of the Indo-European languages, in particular the old Indic languages of India and Iran, and how an understanding of these languages can help us interpret religious texts from ancient cultures.

Languages are curious entities. As children, we have no choice about what language(s) we will speak, and even though we learn to speak our native language(s) well, we can focus better on research in due time, without linguistic worries. Research at an international level sometimes remain.

I have always been fascinated by the human mind, and curious about the possibility of a machine with human-like intelligence and consciousness. After graduating from college in Taiwan with degrees in Life Science and Chemistry, I went to Georgia Institute of Technology in the United States to study Biomedical Engineering. During my PhD, I grew neurones in a petri dish and connected them to a robot, and demonstrated that a robot with an artificial organic brain can learn purposeful behavior. After graduation, I came to Japan and joined RIKEN Brain Science Institute, then National Institute for Physiological Sciences, and now Kyoto University to study how to read minds of humans and monkeys and how to enable the controls of a robot or a computer by thoughts. The classes I teach mostly revolve around the topics of mind and the brain, such as "Mind and Machines: Can a Machine Think?", "Introduction to Computational Neuroscience", and "Fundamentals of Neuroscience". During my time working in different disciplines (biology, chemistry, and engineering) and with different approaches (in vivo, in vitro, and in silico), I have learned that you can always learn new things if you are curious and passionate. So, I want to create an active learning environment where students from any background can enjoy my classes. Particularly, I will de-emphasize materials that have little connection to big picture ideas (those will be forgotten soon anyway) and emphasize real-world assignments, where students learn by doing things relevant to the world outside the classroom.

Graduated from college in Taiwan with degrees in Life Science and Chemistry, I went to Georgia Institute of Technology in the United States to study Biomedical Engineering. During my PhD, I grew neurones in a petri dish and connected them to a robot, and demonstrated that a robot with an artificial organic brain can learn purposeful behavior. After graduation, I came to Japan and joined RIKEN Brain Science Institute, then National Institute for Physiological Sciences, and now Kyoto University to study how to read minds of humans and monkeys and how to enable the controls of a robot or a computer by thoughts.

Message: As mathematicians, we revel in the beauty of our subject matter. Just as a gifted musician gains satisfaction from turning the technical notation written on the page into something that is a delight to listen to, it can be similarly rewarding for a mathematician to see a flow of ideas lead to its conclusion in the proof of a theorem. Unlike music, however, where even a non-expert can appreciate the end result, the output of a mathematician is not always so accessible. Thus, to help students understand the motivation for the fundamental mathematical techniques that will be introduced in my courses, I plan to include links between these and illustrative applications from the natural sciences, engineering, and also social sciences.

Dr. Kai-Chun Chang is a Junior Associate Professor in the Department of Civil Engineering and Earth Resources Engineering, Kyoto University (KU). His main research interests are in bridge structural health monitoring, bridge dynamics and vibrations, and data analysis techniques. Chang received his Ph.D. degree from National Taiwan University (NTU) and worked at the same university as a postdoctoral researcher for two years. During his research career at NTU, he worked mainly on the vehicle-bridge interaction problems, especially on their application to extracting bridge dynamic characteristics. Currently he is working in the Lab of International Management of Civil Infrastructures, KU, and focusing on developing bridge structural health monitoring techniques and systems, solving bridge dynamics and vibrations problems, and many data-analyzing techniques that support the above tasks. He also worked in the Lab of Innovative Techniques for Infrastructures, KU, where his research interest expanded to elastic wave-based nondestructive inspections, especially for concrete structures. Chang’s lectures aim to bridge the gap between the courses in high school and university. In our classes, we have no complicated computations, but illustrative examples provided link to the high school mathematics with natural phenomena; no difficult vocabularies and grammars, but logical rules helpful to read and write scientific papers, and many others awaiting your discoveries.
DE BRETCHT, Matthew  
**Senior Lecturer**  
Graduate School of Human and Environmental Studies

My research interests span several fields, including computer science, artificial intelligence, cognitive neuroscience, mathematical logic, and general topology. The underlying theme of my research has been to better understand information and computation from various perspectives, from mathematics to engineering. Rigorous formalisms to its realization in computers and the human brain.

My first visit to Japan was in 2000, but I have been living here continuously since 2003. I received my bachelor’s degree from the University of Texas at Austin in 2000, where I studied computer science and Japanese. From 2003 to 2005, I was employed in a research project to develop a neural network model to explain parts of the human visual attention system. I was a graduate student from 2005 to 2010 in the Informatics department of Kyoto University, where I studied formal models of inductive inference and its connections with universal algebra and topology. After receiving my PhD, I worked as a researcher to develop machine learning methods to analyze human brain activity measured non-invasively by MEG and fMRI. Meanwhile, I have also been continuing research on the relationships between computation, logic, and topology, with a particular interest in descriptive set theory and domain theory.

DE FELICE, Antonio  
**Associate Professor**  
Yukawa Institute for Theoretical Physics

My profile: My name is Antonio De Felice. I am a cosmologist, who has worked in several countries: USA, UK, Belgium, Japan, Thailand, and now, once more in Japan. I have learned many things by knowing so many different cultures. By meeting so many nice people in my work and life. In my free time, I like cooking Southern Italian bread, and making cheeses.

My message: Cosmology is one of the most fascinating branch of theoretical physics. It tries to give a reason for the astonishing beauty of the cosmos, that we can already see by our own naked eyes, and an explanation for the evident majestic structure the universe endows. It studies the evolution of our sub-continent.

As an environmental historian, my early research and publications were devoted to discussing the emergence of modern flood control and water management in South Asia. At heart, most of my early efforts were aimed at debating the political and environmental consequences of large dams in the Asian sub-continent.

In our contemporary globalized world, even as it is by enemies about global warming and abrupt climate change, scholarship today is seen towards an interdisciplinary mood. The "two cultures" of sciences and the humanities are now more than ever required to find a shared vocabulary with which to debate political solutions and explore imaginations for sustainability at the planetary level.

The courses in the History of Modern Science, Philosophy of Modern Science, Environmental Anthropology, and Environmental Histories of South Asia are intended to explore these big questions of our time by reviewing cutting-edge perspectives in history, philosophy, ecology and anthropology.

DE ZOYSA, Menaka  
**Associate Professor**  
Graduate School of Asian and African Area Studies

My message: I came to Japan after my high school. Finishing one year course of Japanese language at Tokyo University of Foreign Studies, I entered to the Kyoto University. I received the BSc., MSc. and Ph.D. degrees in Electronic Science and Engineering from the Kyoto University. After spending two years as a post-doctoral fellow, I joined the faculty of Kyoto University in 2014. My research focuses on light control to develop next generation optoelectronic devices such as high-power and high-quality lasers, high-efficiency solar cells and narrow-band thermal emission sources.

To the students: During my lectures, I will introduce the fundamentals of light. To obtain a better understanding of the concepts, some experiments will be carried out during the lectures. I will also share my knowledge with the students about the cutting-edge technologies of light control. Students who would like to learn the basics of light, optoelectronic devices (LEDs, lasers, solar cells etc) and cutting-edge technologies of light, are welcome.

D’SOUZA, Rohan Ignatious  
**Professor**  
Graduate School of Science

My field of study is Geophysics, in particular Earthquake Science. I got my Ph.D. degree from Kyoto University in 2004 and afterwards did research in Japan, Germany, and US. I am interested to understand the physics of earthquakes and find ways to reduce the earthquake risk.

Message to students: During classes and seminars we will explore together how the Earth works. You are going to learn about scientific topics that are both fascinating and have an important social impact: the climate change and global warming, the formation of the Solar System and the Earth, the birth and evolution of Life. You will find out about frontier research topics in Earthquake & Volcano Science, as well as Disasters Prevention and Management. I welcome anyone interested to attend.

Teaching style: English is nowadays the main language used to communicate Science. Nevertheless, it can be challenging at times to learn and communicate in a non-native language. I will therefore adjust lectures to address the learning needs of all students and use graphical teaching materials during classes. Keywords will be provided in both English and Japanese.
The E3 course "Theory and Practice in Scientific Writing and Discussion (Pharmaceutical Sciences, English)" aims at providing the students with the foundations of scientific literature. It teaches students how to read and understand scientific papers, as well as how to present their research in a clear and concise manner.

FLORES, Giancarlo
Associate Professor
Graduate School of Engineering

Introduction to Earth Science A (page 185)
Introduction to Engineering Geology (page 191)
Practice of Basic Informatics (page 201)
Scientific English II/E3-2 (Presentation & Discussion) (page 212)

If you were to Drill a borehole in Asia through the other side of the world, you'd end up in South America, where I'm from. This world is not really upside-down over there, and all physical forces work (basically) the same way. But, hopefully, my antipodean perspective will help you see the world in a different and—I wish—a more interesting way.

HEIM, Stephane
Associate Professor
Graduate School of Letters

Introduction to Social Research-E2 (page 53)
Sociology of Work and Organizations-E2 (page 61)
Introduction to Social Research-E2 (page 62)

I received my PhD degree in Sociology at Strasbourg University (France) in 2011, and I am currently Associate Professor at the Faculty of Letters, Department of Sociology (since March 2015). Previously, I was Research Engineer at GEPISDA (http://gerpsda.org), the international network of social scientists on the automotive industry hosted by Paris-Saclay University, ÉNS Cachan, France. I am, among others, member of the GEPISDA’s international steering committee, of the International Journal of Automotive Technology and Management’s Editorial Board (http://www.inderscience.com/ormy.php?editor=gesa), and of my current research interests cover the development of Asian automotive industries, the Japanese higher education system, and the Japanese welfare regime. In the lecture Sociology I, we will explore the social construction of reality and society. In the lecture Introduction to Globalization Studies, we will focus on the economic, social and political dimensions of globalization. In the lecture Introduction to Social Research, students will learn the basic knowledge to become social scientists. In the lecture Sociology of Work and Organizations, we will put the emphasis on work as a central institution of our contemporary societies.

FUSTIN, Jean Michel
Program-Specific Senior Lecturer
Graduate School of Pharmaceutical Sciences

Basic Biology and Metabolism-E2 (page 218)
Introduction to Biological Rhythms-E2 (page 219)
Introduction to Physiology-E2 (page 221)

I am a senior lecturer in circadian physiology and metabolism. After studying at the University of Namur, Belgium, I went to Aberdeen in Scotland where I obtained the PhD investigating seasonal rhythms in Mammals. In 2008, I moved to the Graduate School of Pharmaceutical Sciences in Kyoto University, where I have made important discoveries in the metabolism of nucleosides and nucleic acids. Dr. Fustin current teaching duties comprise two E3/E2 Liberal Arts courses as well as an E3 course.

The aim of the “Basic Biology and Metabolism” and “Introduction to Physiology” E3 lectures is to give basic knowledge in life function by focusing at the most fundamental unit of life: the cell. These two courses, in continuity with each other, are especially tailored for students not familiar with biology wanting to obtain solid foundations in this discipline, and the students who are familiar with the subject but want to brush-up their English.

The other E3 lecture “Introduction to Biological Rhythms” will be taught assuming solid background knowledge in Biology and Physiology. It is tailored to students who wish to know more about the intimate relationship that exists between Life and Time. This course also provides the opportunity to learn and use the precise language and vocabulary of Chronobiology.

The E3 course “Theory and Practice in Scientific Writing and Discussion (Pharmaceutical Sciences, English)” aims at providing the students with the foundations of the scientific language, its structure and vocabulary, and to encourage the students to practice their Scientific English whenever possible. While “Theory and Practice in Scientific Writing and Discussion (Pharmaceutical Sciences, English) A” in the first semester will provide the basics: “Theory and Practice in Scientific Writing and Discussion (Pharmaceutical Sciences, English) B” will require each student to give a presentation in English on a research paper they have analyzed.
I am a researcher at the Research Institute for Mathematical Sciences. When I was a high school student, I thought I wanted to become a physicist with some strong interest in mathematics. But when I actually studied physics, I found out that my interests in mathematics when overthrowing, and so I became a mathematician with some strong interest in physics instead. In particular, Einstein’s theory of General Relativity always fascinated me. Unfortunately, the subject is usually only present to more advanced science students with the necessary background in mathematics and physics, while it should be of great interest to other students. I hope that my class, which is much less ambitious than a standard course in General Relativity, focusing more on developments of geometry in the 20th century and the outer circumstances of Einstein’s life, will fill this gap and make this beautiful theory more accessible to a wider audience.

Professor Antonios KARAISKOS studied law at the University of Athens (Greece) where he obtained a LL.B. and a LL.M. degree, and at Waseda University (Japan) where he obtained a doctorate in law (LL.D.). After working as research associate at Waseda University, assistant professor at Kyoto Gakuen University (Japan) and Phalae University (Japan) and associate professor at Kansai University (Japan), he joined Kyoto University in April 2016 as associate professor at the Graduate School of Law. He was a lawyer registered in Greece (Athens Bar Association). His research interests focus on civil law (contract law) and consumer law, both Japanese and international (particularly European law).

About the lectures: Japanese and international students interested in deepening their understanding of Japanese society and culture, by getting a basic knowledge of how the Japanese legal system works are all welcome. “Law and Culture in Japan” will give an overview of the basic legal institutions in Japan, explain the cultural and social elements behind them, and demonstrate the mutual relation between law and culture in Japan. “Jurisprudence” will give an outline of Japanese law, by explaining the basics of constitutional, criminal, civil and enterprise law in Japan, and introducing its structure and major elements. “Introduction to European Law” will give an overview of the European Union, its history and legal framework. Further, two ILAS seminars (“Contracts and Law in Modern Society” and “Consumer Society and Law”) will also be provided, where a comparative analysis of Japanese and European contract and consumer law respectively will be attempted.

Professor Florence LAHOURNAT is a junior associate professor at the Disaster Prevention Research Institute. Her research interest is in cultural anthropology and material cultures studies, with a special focus on Japan. She holds a PhD from the National Institute of Oriental Languages and Civilizations (Paris, France). As a cultural anthropologist, she is interested in the mechanisms of culture, particularly the adaptive nature of cultural practices: how human rituals – from habits to local traditional practices, adapt to changing circumstances. Part of her current research focuses on the link between local traditions and disaster-affected communities.

Message to the students: I have designed these courses as interactive spaces where students are expected to engage actively with the content and take an active part in the class experience. We will use class discussion, readings, student-led sessions and a variety of materials and activities to make the most of our time together. The objective of this interactive approach is for you to master new knowledge, as well as develop your communicational skills. While no prior knowledge is required for these courses, an open-mind and the willingness to participate are expected.

About the lectures: Japanese and international students interested in deepening their understanding of Japanese society and culture, by getting a basic knowledge of how the Japanese legal system works are all welcome. “Law and Culture in Japan” will give an overview of the basic legal institutions in Japan, explain the cultural and social elements behind them, and demonstrate the mutual relation between law and culture in Japan. “Jurisprudence” will give an outline of Japanese law, by explaining the basics of constitutional, criminal, civil and enterprise law in Japan, and introducing its structure and major elements. “Introduction to European Law” will give an overview of the European Union, its history and legal framework. Further, two ILAS seminars (“Contracts and Law in Modern Society” and “Consumer Society and Law”) will also be provided, where a comparative analysis of Japanese and European contract and consumer law respectively will be attempted.

Dr. Sunmin Kim got his doctoral degree at Department of Urban and Environmental Engineering of Kyoto University after he finished his undergraduate and master course at Chungnam National University, Korea. His research background is based on civil engineering and hydrology specializing in water resources management and flood risk management. He is interested in solving various types of international water problems from an engineering aspect considering environmental change and climate change. He is giving several lectures for undergraduate course with subjects related to physics and engineering mathematics, which are Physics of Wave and Oscillation, Probabilistic and Statistical Analysis and Exercise, Advanced Dynamics, Scientific English 1B. Feel free to come to his exciting classes and enjoy his energetic lectures.

ILAS Seminar-E2: The Life and Work of Albert Einstein (page 230)
ILAS Seminar-E2: Contracts and Law in Modern Society (page 291)
ILAS Seminar-E2: Consumer Society and Law (page 291)
ILAS Seminar-E2: Contracts and Law in Modern Society (page 235)
ILAS Seminar-E2: Consumer Society and Law (page 291)

ILAS Seminar-E2: Contracts and Law in Modern Society (page 235)
ILAS Seminar-E2: Consumer Society and Law (page 291)

ILAS Seminar-E2: Introduction to cross-cultural communication (page 292)
ILAS Seminar-E2: Introduction to cross-cultural communication (page 292)

ILAS Seminar-E2: The Life and Work of Albert Einstein (page 230)
ILAS Seminar-E2: Contracts and Law in Modern Society (page 291)
ILAS Seminar-E2: Consumer Society and Law (page 291)
To the students: Revisiting Basic Organic Chemistry I and II are intended to follow the courses as provided one semester earlier and to give students a chance to review the information again in English. The seminar entitled "Introduction to Environmentally Friendly Chemistry" introduces the concept of environmentally friendly chemistry and the basic principles for achieving cleaner and safer methods in research for students at an early stage with the intention that they can apply these principles in their research from the beginning. The seminar entitled "Smart Materials: Innovations in Materials Chemistry" is intended to equip students with a basic understanding of what might be defined as a smart material and how these materials are present in current research and applications and to inspire students to pursue creativity in future research or studies.

LE GALL, Francois
Program-Specific Associate Professor
Graduate School of Informatics

I am an associate professor working at Kyoto University in the Department of Communications and Computer Engineering. I received a Ph.D. in computer science from the University of Tokyo in 2006. My research interests include algorithms, computational complexity and quantum computation, a new and exciting computing paradigm based on the laws of quantum mechanics.

Message to students: Algorithms are not only useful and important, they are also beautiful and fun to learn! My lecture "Introduction to Algorithms" provides a broad introduction to the subject, while my other lecture "Fundamentals of Discrete Optimization" gives an accessible presentation of methods for solving hard problems in practice. The lecture "Introduction to Coding Theory & Cryptography" focuses on other related fascinating aspects in computer science, such as techniques to compress and protect against noise or malicious third parties, which are essential to today's communications.

LEE, Shiu Hang
Junior Associate Professor
Graduate School of Science

I am an astrophysicist and a brand new staff member at the Department of Astronomy. Born in Hong Kong, I obtained my Bachelor degree from the Hong Kong University of Science and Technology (HKUST), and my PhD in Physics from Stanford University in the sunny California. I mainly study exploded stars (supernovae) and the beautiful nebulae they leave behind, among other cool things like cosmic-rays.

Message to students: my introductory lecture will bring you to the fascinating world of modern astronomy and astrophysics. We will start from our Solar neighborhood, and gradually depart into the vast interstellar spaces, seeing many awesome astrophysical objects en route through our Milky Way galaxy. We will then charge forward to encounter other galaxies and ultimately have an outlook over the Universe itself. Let's enjoy the cosmic journey together!

LIN, Donghui
Program-Specific Associate Professor
Graduate School of Informatics

I am currently an associate professor in Graduate School of Informatics, Kyoto University. I received my M.E. degree in computer sciences and engineering at Shanghai Jiao Tong University in 2005, and Ph.D. degree in social informatics at Kyoto University in 2008. During 2008 to 2011, I was a researcher of National Institute of Information and Communications Technology, Japan. After that, I have worked as an assistant professor in Graduate School of Informatics at Kyoto University until March 2018. My research interests include services computing, malignant systems, and intercultural collaboration.

I am highly motivated to teach English courses in Institute for Liberal Arts and Sciences because I have conducted the research on computer-mediated intercultural collaboration and multilingual communication for more than ten years. For the education of informatics, I aim to create a network among students with different backgrounds by stimulating the students who major in informatics to be interested in real problems in the society, and the students who do not specialize in informatics to get interested in informatics as much as possible. I believe that the cultivated network will become important as the students' grade increases.

LINTULUOTO, Juha
Associate Professor
Graduate School of Engineering

I studied organic chemistry at The University of Helsinki in Finland to obtain M.Sc.

After working for a while in a petrochemical industry, in 1993 I entered Kyoto University Graduate School of Engineering and later obtained PhD in Synthetic and Biological Chemistry. I have practiced a wide variety of chemistry, and involved in teaching of subjects such as engineering project management and economics. I am also teaching presentation skills for engineering students.

The above listed courses are (or will be) taught for undergraduate students on 2017.

I also teach Engineering Economy for Engineering Undergraduate Students, and Advanced Engineering Economy and Engineering Project Management for Graduate School Students. Also, in the future I will teach Supramolecular Chemistry for Graduate School Students (the course preparation is underway).

LOPEZ, Mario Ivan
Associate Professor
Center for Southeast Asian Studies

I am a cultural anthropologist who works on transnational migration, care for ageing societies and sustainability issues in Southeast Asia and the Asian Pacific region.

My introduction to globalization courses offer students the chance to engage and discuss core processes that underlie present day human movement and also learn about issues that impact contemporary societies. A series of themes act as stepping-stones for students to learn and explore the different aspects of globalization that play out in Asia-pacific, Southeast Asia, and other regions in the world. Students will look at themes such as modern-day migration, prosperity and growth, ageing, global consumption and our core values as a species.

My cultural anthropology courses offer students a chance to see how anthropology can have practical relevance in understanding modern day societies and cultures. Students will be introduced to the discipline's basic core concepts and all classes engage with real life examples to place the study of cultures and societies in identifiable contexts with the aim of deepening student's knowledge and interest of other societies and cultures. One course will focus specifically on the broad diversity of gender experiences available in contemporary societies. It hopes to provide students with an analytical framework to contextualise gender diversity and its continual transformation over the past couple of centuries to situate our own experiences.
MACINTOSH, Andrew
Associate Professor
Primate Research Institute

I am an Associate Professor at Kyoto University’s Primate Research Institute, where I work in the Center for International Collaboration and Advanced Studies in Primatology and the Department of Ecology and Social Behavior. I graduated with a Ph.D. degree from the Division of Biological Sciences at Kyoto University in 2010, after studying behavioral ethology at the University of Calgary during my undergraduate and Master’s degree programs in my home country of Canada. I have studied primate behavioral ecology on 5 continents over the last 20 years. My current work links primate behavior with infectious disease ecology, both in Japan and in tropical forest ecosystems such as in Borneo. I also work with various penguin species to understand links between foraging behavior, resource distributions and ecological challenges like infectious disease and climate change.

My courses are about the scientific study of animals, their behavior and ecology, their conservation, and the mechanisms underlying their activities, right from their genes to their minds. As a long-time student of animal behavior myself, I really look forward to embarking on these journeys with students enrolled in the courses. Watching animals in nature, at zoos or aquariums, at wildlife parks or sanctuaries, or even at home to always a rewarding experience, but understanding the roots of what we see, discovering why animals do what they do and even think what they think, can bring our animal encounters to new heights. Join these courses if you want to learn more about the science of animal behavior, about the threats pushing animals across the planet towards the brink of extinction, and about how zoos and conservationists are using science to protect natural areas and endangered species before they are lost, so that we can all enjoy the natural world for generations to come.

MALANOLO, Emmanuel
Professor
Graduate School of Education

I am a New Zealander and a professor at the Graduate School of Education at Kyoto University. I completed a PhD in psychology at Massey University in New Zealand, and I have held academic appointments at the University of Auckland in New Zealand and Waikato University in Toronto. My research area is educational psychology; much of my research has used student learning strategies, like critical thinking, memorization, and diagrams in problem solving and communication. I have over a hundred research publications – including recently, articles in journals like Quarterly Journal of Experimental Psychology, Thinking Skills and Creativity, and Mind, Brain and Education.

I have designed the course I teach so that students will not only learn about the education-related topics covered in these courses, but also develop their thinking and communication skills. Thus, in these courses, students do not just listen to me talking – they also have to complete various tasks, work collaboratively with other students, and report back on what they have achieved and opinions they have formed. I provide detailed information about the requirements and expectations of each course, and how exactly students will be assessed and graded.

MCLELLAN, Benjamin
Associate Professor
Graduate School of Energy Science

The courses I teach are described briefly below, but in general aim to bridge the natural and social sciences – hopefully providing useful alternative perspectives for students of both areas.

Introduction to Mineral Resources-E2 (page 192)
Science, Society and Environment-E2 (page 229)
Introduction to Sustainable Development-E2 (page 230)
ILAS Seminar-E2:Logic, Critical Thinking and Argument (page 259)

NEWTON, Jonathan Charles Scott
Associate Professor
Institute of Economic Research

I am a game theorist specializing in evolutionary game theory in the social sciences, particularly in economics. Much of my work has been on incorporating ideas of collective agency - making decisions together with others, into evolutionary game theory. This involves tackling questions of how the inclusion of such agency affects economic outcomes and in what circumstances we can expect collective agency and jointly intentional decision making to emerge in populations. An example of such jointly intentional decision making is the organization of a hunt that requires several people to collaborate. Another example is found in matching problems, such as marriage, in which decisions on partnerships have to be agreed by more than one person. Aside from its relevance to economic decision making, my work has also been influenced by and bears some relation to certain subfields of philosophy, computer science and psychology.

I shall be teaching courses in introductory economics and principles of economics, as well as specialist seminars related to the emergence of norms and conventions, topics that can be studied using the tools of game theory.

I was born in Scotland, but have lived in a few places and completed my doctorate at the University of Cambridge.

OKEYO, Kennedy Omondi
Senior Lecturer
Institute for Frontier Life and Medical Sciences

Here and now to meet you. My name is Kennedy Okeyo. I was born and raised in Kenya until after high school when I came to Japan for further studies. It’s been over 17 great years living in Japan, both as a student and, now, as a working adult. Throughout these years, I have enjoyed the wonderfulness of nature and the subtleness of the Japanese culture. Additionally, my life has been touched and enriched by the many wonderful persons I have had the opportunity to interact with.

As a young and aspiring professor, one of my priorities is to let diligently to my students and grow up together with them intellectually through research as well as discussions on various scientific topics. Given my background in mechanical engineering and research interest in bioengineering—a multi-disciplinary field encompassing biology, engineering and physical sciences—my teaching style emphasizes on multidisciplinary discussions with my students and tries to impact upon them the ability to integrate knowledge acquired from different courses toward solution of complex problems.

As an alumnus of Kyoto University, I am excited to be back and contribute to the advancement of research and intellectual growth at this great institution. Nothing can be more rewarding than to get an opportunity to live again in the beautiful city of Kyoto. I’m a soccer and marathon enthusiast. So please invite me for a run along Kamogawa river. I look forward to great years ahead working together with both colleagues and students at Kyoto University.

PARK, Jaehong
Senior Lecturer
Graduate School of Engineering

Profile: Dr. Jaehong Park received his bachelor’s degree in chemistry and earth system sciences from Yonsei University (South Korea). After his experience in the industrial sector (Samsung Electronics), Dr. Park pursued his doctorate in physical chemistry from the University of Pennsylvania, under the supervision of Professor Michael J. Thienel. Following his graduate studies, Dr. Park joined the Chemistry and Nanoscience Center at National Renewable Energy Laboratory (NREL) as a postdoctoral researcher in Dr. Gary Pumphrey’s group. In 2017, he joined the Department of Molecular Engineering in Kyoto University as a lecturer. His current research interest spans fundamental understanding of charged carrier and exciton dynamics in nano-sized structures, including organic/molecular hybrid perovskites, organic-based architectures, and semiconducting singlewalled carbon nanotubes, using experimental physical chemistry methods.

Message to students: In my classes, I aim to help students become independent learners and thinkers regardless of their scientific goals. In general, my focus is on arousing students’ ability of identifying chemical problems around them, and to guide students in establishing the skills and habits of logical thinking so that they can further address solutions using scientific knowledge. Especially, in my physical chemistry courses, I hope to introduce basic principles that govern the behavior of molecules.
mathematics to understand and predict the behavior of classical objects, in the seminar "The wonderful world of quantum physics" we will forget (nearly)
material begins to levitate. In other materials the electrons align when being cooled, and the material becomes a magnet. In my courses I will explain how
am interested in quantum theory, especially in quantum many-body phenomena. Bringing together many quantum particles at one place, fascinating and
chemistry behind coffee, bacon, chocolate, shampoo and much more!

In the first semester, my seminars will give an introduction to robotics and wearable technology. The largely practical content of these seminars is aimed at
helping students to develop a strongly connected theoretical and applied understanding of the taught material. I hope this will make the content approach-
able to students of varied learning styles and backgrounds, leading to group work in varied and multi-strength teams.

In the second semester my classes will cover an introduction to programming (in the Python language) and scientific writing and research communication.
These classes will aim to show the cross disciplinary applicability of coding and scientific writing, with the aim of enabling students to use these tools to en-
hance their broader study.

These classes will aim to show the cross disciplinary applicability of coding and scientifi c writing, with the aim of enabling students to use these tools to en-
hance their broader study.

These two values underline my passion for my role (as I see it) here at Kyoto University as a “facilitator for capacity building” in the fi eld of plant science.
My personal philosophy on education:
Education is not about content delivery, or teaching students “everything they need to know”, but about capacity building: enabling students to become skilful, flexible, self-propelled learners, capable of taking on the next unknown challenge around the corner”.

Personaliy of students take fi nal shape at the University. I hope to offer courses and content that will enable our students to learn new life skills and also
shape their unique philosophical outlooks that will help them develop their personality. I also believe that learning should not be a stressful process rather
it should be enjoyable and curiosity driven. I aim to make my classes very practical and present information in a simple format. I like to use technology in
the classroom to make the learning process very relevant for the current generation of students.

I received my Master’s and PhD degrees from University of Queensland, Australia and subsequently came to Japan in 2014 as a Hakubi Researcher. As a
nutritional physiologist, my research aims to understand the effects what we eat on our organs, particularly the heart. As a common trait in physiologists,
I am also interested in things that are outside my area of expertise and sometime outside the boundaries of medical sciences such as local culture, traditions and religion!
The purpose of my courses is not the sole memorisation of facts, but to provide a framework that helps students to develop their own questions and to challenge the existing ideas and thoughts. I believe the greatest source for human learning is to pursue their own individual motivations. So in my class I wish to encourage and stimulate students to pursue their own motivations, their own interests to learn the social system and explore the world around them. I wish that in my classes there will not be any hierarchy between teachers and students, but learning and teaching would be through reciprocal and interactive dialogues, exchanging ideas, learning mutually.

My academic interest encompasses at knowing why different people perceive risk differently, what are their motivations to take risk preventive actions and how these local people can be more meaningfully involved in the risk management process. I had the opportunity to conduct in-depth field surveys in different countries such as India, Bangladesh, Japan and recently in Ghana (Africa) in different disaster risk contexts. I believe the greatest source for human learning is to pursue their own individual motivations. So in my class I wish to encourage and stimulate students to pursue their own motivations, their own interests to learn the social system and explore the world around them.

RAKERS, Christin
Graduate School of Pharmaceutical Sciences

I studied biochemistry and biomedicine in Germany and obtained a PhD in computational pharmaceutical sciences from the Free University Berlin. Before coming to Kyoto, I pursued postdoctoral studies at Nagoya University. My interests are computational molecular design, medicinal chemistry, chemoinformatics, and data science.

The purpose of my courses is not the sole memorisation of facts, but to provide a framework that helps students to develop their own questions and to find their way to potential answers. To quote Albert Einstein: “It is not that I’m so smart. But I stay with the questions much longer.”

RAJENDRAN, Arivazhagan
Institute of Advanced Energy

Profile: Arivazhagan Rajendran received his Master degree with specialization in Inorganic Chemistry from University of Madras, India. After completing his Master degree, he participated in many short-term research training programs at various institutes such as Tohoku University, Japan, Max Planck Institute for Bioinorganic Chemistry, Germany, and Central Leather Research Institute, India. He then began doctoral research in Bioinorganic Chemistry working with Prof. Tatsumi at Tohoku University. After earning Ph.D. in 2006, he joined as a Postdoctoral Researcher. Then, he moved to Institute for Integrated Cell-Material Sciences, Kyoto University and worked on scaffolded DNA origami based Nano-Biotechnology. After working at Life Science Center of Tsukuba Advanced Research Alliance, University of Tsukuba as an Associate Professor, in 2015 he joined Institute of Advanced Energy, Kyoto University as a Junior Associate Professor.

Message to the students: The aim of the courses mentioned above is to teach the advanced energy science through fundamental physical chemistry starting from the structure and electronic properties of atoms. These basic courses will help the students to understand the chemistry involved in sustainable energy, energy production, storage, environmental issues, and so on. Besides the technical aspects, I can speak little Japanese which will greatly help me to communicate with the students.

RAPPLEYE, Jeremy
Graduate School of Education

What are you doing here at Kyoto University? How will you spend your short time here? At the center of any university is the interaction between students and teachers that we call “teaching and learning”. This exchange seems easy and straightforward, but arguably nothing is more complex or more important.

My classes will introduce students to the wonderfully complex world of education, specifically teacher-student relationships, an interaction we simply call “pedagogy”. Most of us think we know pedagogy because we have attended school all our lives. You might ask, what could be so complicated? Come to my class and you will find out.

I grew up in California, attending Yale as an undergraduate and Oxford for my PhD. I have researched and taught at Japan’s leading universities, including Tohoku University, Osaka University, and ICU. Now I am an Associate Professor at the Graduate School of Education at Kyoto University. For students aiming to become global leaders and escape a parochial outlook, I strongly recommend this course: differences in cultures and thought begin from the way we are taught in school. After taking my class, you will be able to think critically about how you are being taught in all your Kyoto University courses. I hope this will help you make the most of your short time here.

RUDOLPH, Sven
Graduate School of Economics

Before coming to Kyoto University, I was Assistant Professor for the Political Economy of Environmental Policy at Kassel University, Germany. My particular research focus is on climate policy and energy policy as well as on market-based instruments such as emissions trading and eco-taxes. On these subjects, besides Germany and Japan, I have also done research in the UK and the US and have presented on numerous international conferences in Europe, America, and Asia. As a university lecturer, I have always strived for an interactive, cooperative, and motivating way of teaching. In class I use multiple learning methods, and the courses aim at being highly practice-oriented, immediately applying the theoretical concepts to real-world problems.

Now I am very much looking forward to teaching but also learning from students in Japan.

SAMADDA, Subhajyoti
Disaster Prevention Research Institute

I joined as an Associate Professor at Disaster Prevention Research Institute in Kyoto University. I have an interdisciplinary academic background including social anthropology, urban planning and disaster risk management. I did my PhD from Kyoto University, Japan and Master of Urban Planning from School of Planning and Architecture, New Delhi, India.

My academic interest encompasses at knowing why different people perceive risk differently, what are their motivations to take risk preventive actions and how these local people can be more meaningfully involved in the risk management process. I had the opportunity to conduct in-depth field surveys in different countries such as India, Bangladesh, Japan and recently in Ghana (Africa) in different disaster risk contexts.

I believe the greatest source for human learning is to pursue their own individual motivations. So in my class I wish to encourage and stimulate students to pursue their own motivations, their own interests to learn the social system and explore the world around them. I wish to teach the existing ideas and thoughts.

QURESHE, Ali Gul
Graduate School of Engineering

Profile: Dr. Qureshi has earned a doctorate degree in Engineering from Department of Urban Management, Kyoto University. He has also got a Master of Engineering degree from the Asian Institute of Technology, Thailand, and a Bachelor of Engineering degree from Mehran university of Engineering and Technology, Pakistan.

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I believe the greatest source for human learning is to pursue their own individual motivations. So in my class I wish to encourage and stimulate students to pursue their own motivations, their own interests to learn the social system and explore the world around them. I wish to teach the existing ideas and thoughts.
Together with six other teachers I am teaching the "English Scientific Debate". I hope students will learn to better express and discuss the complexities of challenges in society. We see this as an important topic also because pulling successful research into practice often requires difficult discussions with different stakeholders. We hope this class can contribute to equipping students for this.

SUGUIMOTO, S. Pilar
Junior Associate Professor
Graduate School of Medicine

Self Introduction
S. Pilar Sugimoto is Junior Associate Professor at the Medical Education Center in the Graduate School of Medicine, Kyoto University. She is third generation Japanese Peruvian, born and raised in Lima, Peru. Dr. Sugimoto earned her medical degree from Universidad Peruana Cayetano Heredia in Peru and her PhD degree from Kyoto University. She collaborates with the Department of Global Health and Socio-epidemiology in the School of Public Health of Kyoto University. Her research interest is molecular mechanism of C to U RNA editing, which is indispensable for proper expression of gene function in plant organelles. Recent our data suggested different types of proteins form dynamic complexes to pursue the reaction. We are searching for missing components in the complexes and analyzing how the complexes assemble in plant organelles.

Message to students: Plant biology has been an important subject from the earliest study of life processes. Research on plant system will also tell us how to approach problems in agriculture and environment. In my lecture courses, I will teach basic cell biology and plant biology with introduction of recent research topics. In the seminar courses, we will read recent scientific literatures especially on plant biology. You will be expected to learn basic skills for reading manuscripts, summarizing the contents, and giving presentations on them. You will be also encouraged to discuss the topics in English. However, you will not be expected to speak native-like English, therefore, don't hesitate to express yourself at the course.

SCHMOCKER, Jan-Dirk
Associate Professor
Graduate School of Engineering

My research interests are understanding people's travel behaviour and transport planning. This combines social psychology, operations research, economics as well as other disciplines. Exciting opportunities as well challenges arise in this research field nowadays through the availability of "big data" and key developments such as sharing economy, electromobility and autonomous driving.

SVADLENKA, Karel
Associate Professor
Graduate School of Science

Professional background: Originally from Czech Republic, I got my PhD from Charles University in Prague and also from Kanazawa University, Japan. My research focuses on using mathematics (especially partial differential equations) to understand various natural phenomena, including modeling and numerical simulation.

Message: The course calculus provides the very basic knowledge necessary in any field of science and engineering, which has some connection to mathematics. This means mainly the differentiation and integration of functions of one real variable (first semester) and several variables (second semester). However, we will start from the fundamental concepts, such as "What is a real number?" or "How do we precisely define continuity?". After finishing this course, you should be able, for example, to find maxima of a function, to compute volume of an object or to solve differential equation modeling some natural phenomenon. There are a lot of things to learn in order to master the basic calculus and everything has to be done precisely because it is mathematics. Nevertheless, I hope you will be brave enough to join the class and to learn math or maybe just to practice your scientific English.

SINGER, Jane
Associate Professor
Graduate School of Global Environmental Studies

Professional background: Jane Singer is associate professor of the Graduate School of Global Environmental Studies. She has a master's degree in international affairs from Columbia University and a PhD in global environmental studies from Kyoto University. An American with 30 years' residence in Japan, she was formerly a professional magazine and newspaper journalist and editor. She specializes in development studies, focusing on human migration and displacement and community resilience, with a regional focus on Southeast Asia.

Message about my courses: I'm interested in how people are affected by the process of economic development and environmental change, and in my courses we will study human interactions, and those of people and the environment, using readings, videos, lectures, and classroom discussion. Students will also conduct their own research on topics that interest them, to share with others in the class. Even students without much background in the social sciences should find many topics that will relate to their studies and their interest in a rapidly changing world impacted by globalization, technological innovation and climate change. The English language is the communicative tool used for study and expression, but the objective of these courses is to master the content – development studies, environmental studies, human geography or sociology – in an interactive, student-directed learning approach.

SUGIMOTO, Takanori
Junior Associate Professor
Graduate School of Global Environmental Studies

Professional background: Takanori Sugi is Junior Associate Professor in the Graduate School of Global Environmental Studies at Kyoto University. He received a PhD degree in Environmental Science and Engineering from the University of California, Berkeley in 2004. He is interested in human geography and environmental studies with a focus on the Pacific Basin. He has a background in regional sustainability in Southeast Asia and has worked in the region over the past decade.

Message about my courses: These are basic courses prepared for all majors. You are expected to be motivated to learn, do your best, engage in class discussions, and enjoy every step of the way.

TAN, Fucheng
Senior Lecturer
Research Institute for Mathematical Sciences

The course instructor is Fucheng Tan, a lecturer from Research Institute for Mathematical Sciences. He obtained his PhD in mathematics from MIT, and had taught in the US for 5 years before joining Kyoto University. As for teaching, he believes in continuous communication between teachers and students, and encouragement.

[Quest for Mathematics VI] Calculus and Linear algebra from the basis of mathematics to support science and technology. The course is designed to improve students' ability of expressing calculus and linear algebra in English. In this class, assumed to have basic knowledge in at least one of them, students will concentrate on improving communication and discussion skills in English for related mathematical topics. We shall emphasize on oral communication and in-class presentations. The first 10-15 minutes of each lecture will be devoted to the review of previous lecture assigned to a student. At the end of the class, students are expected to be able to present mathematics and discuss with others in English efficiently. The textbooks will be the classical ones the instructor used previously in the US. Certain online materials will be introduced in class, for example, the video lectures from MIT.

[ILAS Seminar: Encounters with modern arithmetic] In this class, we will learn the basic concepts and theorems in group theory, ring theory, field theory, and Galois theory, which form modern algebra. Both concepts and examples will be emphasized. We intend to cover the material in an accessible and yet interesting way, to make it accessible to most undergraduate students. In fact, we will learn modern algebra with the following concrete goal in mind. That is, to answer a classical question from centuries ago whether a cyclic polynomial equation is solvable in the elementary way, i.e., with only use of the usual operations not beyond radicals. At the end, we shall be able to determine which cubic (or higher degree) equations are solvable this way. Along the way, we shall see the elegance and beauty of modern algebra. The textbooks will be the classical ones the instructor used previously in the US.
TASSEL, Cedric
Associate Professor
Graduate School of Engineering

Fundamental Chemical Experiments-E2 (page 134)
Introduction to Inorganic Chemistry A-E2 (page 147)
Introduction to Inorganic Chemistry B-E2 (page 149)

Cedric Tassel is an Associate Professor in the Department of Energy and Hydrocarbon Chemistry. He was born in France where he obtained a Bachelor and Master Degree in Solid State Chemistry from the University of Rennes I. Cedric holds a PhD in Engineering from the Graduate School of Engineering, Kyoto University. In 2012, he became a Habilitation Assistant Professor with his research focusing on the synthesis of novel oxide materials via organic synthesis techniques. More recently, his interests are in the preparation of amorphous structures oxide-hydroxide and oxide-nitride towards the realization of functional materials.

To the students: The “Introduction to Inorganic Chemistry A-B” lectures will introduce the basic concepts of chemistry from the structure of atoms and molecules to the study of their bonding, interactions and reactions. Chemistry surrounds us and I hope that this course will provide students with a better understanding of its impact on our daily lives and environment.

THUERMER, Stephan
Program-Specific Associate Professor
Graduate School of Science

Equilibrium and Energy-E2: A Macroscopic Perspective of Chemistry (page 137)
Introduction to Surface Chemistry-E2 (page 151)
ILAS Seminar-E2: Understanding Water and other Liquids from a Scientific Perspective (page 272)
ILAS Seminar-E2: How to Study Atoms and Molecules with the Help of Light (page 299)

Before coming to Japan in 2013 my home was Berlin, Germany. I initially studied and graduated in physics, but over time my research was drifting more and more towards chemistry. In my days as graduate student I became interested in studying the phenomena underlying chemical reactions on the molecular level in liquid water and solutions. I am continuing this work here at the Department of Chemistry. I study molecular properties in liquids using spectroscopy, that is, utilizing the interaction of light with matter to learn about processes on the invisible atomic scale.

The quest in natural sciences is always to think about and find the underlying mechanisms for the observed effects or processes. I would like bring this philosophy of exploration and critical thinking to the lecture as an important skill of scientific research. In the courses we look at phenomena which are associated with all kinds of neurodegenerative diseases such as Huntington’s, Alzheimer’s and Parkinson’s diseases. I am also always interested in a cellular pathway called macroautophagy, which is the degradation system of bulk matter such as the amorphous protein aggregates that are associated with all kinds of neurodegenerative diseases such as Huntington’s, Alzheimer’s and Parkinson’s diseases. I am also always interested in developing new biophysical tools to analyze and understand protein motion and function.

VAN STEENPAAL, Niels
Associate Professor
Graduate School of Education

Japanese History I-E2 (page 32)
Japanese History II-E2 (page 37)
Japanese Intellectual History I-E2 (page 38)
Japanese Intellectual History II-E2 (page 39)

Dr. Van Steenpaal is an intellectual historian with a primary research interest in “moral culture”, a term that he uses to describe the pathways, processes and media through which morality and material culture mutually influence each other. Since all history is forged from curiosity and skepticism, I strongly encourage these values in my classroom as well. Feel free to speak up at any time to ask questions or (kindly and respectfully) challenge either me or your fellow students.

VANDENBON, Alexis
Program-Specific Senior Lecturer
Institute for Frontier Life and Medical Sciences

Basic Data Analysis-E2 (page 195)
Introduction to Inorganic Chemistry A-E2 (page 197)
ILAS Seminar-E2: Programming for data analysis (page 273)
ILAS Seminar-E2: Introductory Bioinformatics (page 300)

After studying biochemistry in Belgium, I completed a PhD degree in the University of Tokyo, where I investigated the sequence and structure of regulatory DNA sequences using bioinformatics. After graduating, I conducted research in the fields of bioinformatics and immunology in Osaka University, and since 2017 in Kyoto University. My main research interest is the regulation of gene expression.

We are living in the age of “big data”, and research is increasingly data-driven. But data is not the same as knowledge. Our goal is to extract knowledge from data, and this is the focus of my courses. My course on statistics introduces how to analyze and draw conclusions from observations. The course on data analysis explore machine learning techniques to find patterns in data, and in the programming course you can learn how to write scripts to easily perform data analysis. Finally, the course on bioinformatics gives a broad introduction to data-oriented research in biology, genomics and proteomics.

VILAYVONG, Khonesavanh
Assistant Professor
Graduate School of Agriculture

Science on Water, Soil and Ecosystems-E2 (page 188)
Sustainable Forest Environment-E2 (page 232)
ILAS Seminar-E2: Regional Disaster Prevention (page 274)
ILAS Seminar-E2: Geo-Disaster Risk Reduction and Prevention (page 301)

Born in the Land of Million Elephants or Laos, my first degree was from Nanyang Technological University in Singapore. My advanced degrees were conferred by Kyoto University in the field of civil and structural engineering. My academic and research interests are in the field of environment and climate-related disaster prevention. Besides, I actively participate in the field of environmental assessment. Most of my previous project experiences were from multi-national and multi-cultural international organizations (For example: UNDP, UNICEF, JICA, SIMX), where I served as a national advisor, a technical staff, a researcher, and a worker.

Welcome to my courses. As a student of globalized, globally recognized and connected mind at Kyoto University, you are cordially invited to enroll to my courses. In the courses, you will learn about the basic elements of the environment, air, water, minerals and soils and their vital functions and roles in agriculture, forests, ecosystem systems, and environmental sustainability. In detail, what are the connections between the elements and natural systems, which enable favorable conditions for our existence, or otherwise adverse consequences such natural and man-made hazard and disaster (famine, deltor- estation, climate change, floods, earthquakes, and tsunami)? What kind of basic sciences, measures and technologies available to deal with such calamity? Besides conventional method of learning science at a tertiary level, you will embark on skill building toward academic, practical and career-oriented perspective. Definitely, if you keep constant effort and commitment on acquiring new knowledge, you ought to make an educated progress in your endeavor.

WALINDA, Erik
Assistant Professor
Graduate School of Medicine

ILAS Seminar-E2: Introduction to Biomedical Presentation and Debate (page 275)
ILAS Seminar-E2: Introduction to life science and scientific discussion (page 277)
ILAS Seminar-E2: Biochemistry Principles (page 302, 303)

Research. After getting my degree in Biochemistry in Germany from the Free University of Berlin, I joined a PhD course at Kyoto University where I studied protein–protein interactions using biophysical methods such as calorimetry, fluorescence and nuclear magnetic resonance spectroscopy. I am particularly interested in a cellular pathway called macromotaphagous, which is the degradation system of bulk matter such as the amorphous protein aggregates that are associated with all kinds of neurodegenerative diseases such as Huntington’s, Alzheimer’s and Parkinson’s diseases. I am also interested in developing new biophysical tools to analyze and understand protein motion and function.

Education. In all of my classes, students get the chance to talk and discuss in English. To join the class, you need a tiny bit of courage, but afterwards your speaking and tolerating skills will definitely be improved. You also learn about science. Yet! This year I will teach three ILAS seminars’ Presentation and Debate on Biomedical Sciences, Bioinformatics Principles and Introduction to Life Sciences and Scientific Discussion. The presentation and debate classes is an introduction on how to present your ideas to an international audience (in English). We focus on simplicity. We do not make things complicated. We also discuss and debate about some specific topic. The biochemistry seminar Introductions to Biochemistry introduces the field of biochemistry. We also solve biochemical problems in class to check our understanding. Introduction to life science and scientific discussion is something like a mixture of them. It has both presentation and molecular biology in it. It is my hope that all students enjoy their time here at Kyoto University and in the time being here discover some aspect of science that they truly interested in.
WANG, Yingyan
Associate Professor
Graduate School of Economics

I am an Associate Professor at the Graduate School of Economics of Kyoto University. I received a PhD degree in Economics from Kyoto University and an MA degree in Business Research from Stanford University. Prior to joining the Graduate School of Economics at Kyoto University, I was an associate professor in human resource management at Hitotsubashi City University. My research, drawing largely on organizational behavior and human resource management perspectives, examines organizational commitment, turnover and retention, management philosophy and dynamics underlying individual cognition and behavior at workplace.

I teach two English courses related to management: Introduction to Management and Contemporary Management. Knowledge of management is not a requirement to enroll in these courses, but students should have an interest in the study of business management in English. Introduction to management provides students with the most fundamental and broad overview of management theories, concepts, and basic practices. The focus is four primary management functions, including planning, organizing, leading and controlling. Contemporary management covers critical issues in management, including topics such as motivation, leadership, career, and organizational culture. Students will read related materials, have discussions about some important theories and concepts, comment on assigned topics, and give several simple case presentations.

WENDELL, Roger
Associate Professor
Graduate School of Science

Physics is a powerful tool for understanding the natural world starting from sets of fundamental principles. This is true of all branches of physics, from the classical study of motion with Newtonian mechanics, to the quantum mechanical description of radioactivity and beyond. Moreover, our modern description of nature is built upon a foundation of experimentation and observation, which can be referenced or reproduced to reaffirm and propagate our understanding to others. Lecture material will accordingly be supported by concrete example and reference to relevant experiments. While it may seem daunting to learn physics at any level in a foreign language, English is currently the primary language used to communicate ideas in the fields of science and technology, so training oneself early will provide access to a wide and wonderful world of scientific thought and inquiry.

Most of my research is dedicated to the study of neutrino oscillations and this pursuit brought me to Japan in 2008. Primarily I work on the Super-Kamiokande experiment, which was awarded the 2015 Nobel Prize in physics, and the T2K experiment. Prior to joining the faculty of Kyoto University, I was a researcher at the University of Tokyo’s Institute for Cosmic Ray Research. Far prior to that I was born in and later trained in science at various institutes in the United States.

YANG, Chin-Cheng
Junior Associate Professor
Research Institute for Sustainable Humanosphere

Profile: Chin-Cheng (Shotty) Yang is currently a Junior Associate Professor with Research Institute for Sustainable Humanosphere at Kyoto University, where he initiates the “Laboratory of Ecosystem Management & Conservation Ecology” April 2016. He completed his Ph.D. in Entomology from National Taiwan University (NTU) and received the postdoctoral training at Biodiversity Research Center at Academia Sinica. Before joining Kyoto University, he was affiliated with NTU as an associate professor for almost 5 years. His primary research interests involve population biology (genetics, behavior and ecology) and management of the invasive species, with particular emphasis on invasive social insects such as ants.

Message: My courses target not only management strategies but also practical solutions to deal with negative impacts and consequences of multiple threats on the Humanosphere. Simply speaking, students who care about where we human beings live, especially improvement of its health and sustainability, are encouraged to take the courses regardless of the academic background. Please do not worry about the course content being too complicated to understand because they are pretty much case-driven and fundamental. Also, I like interacting with/listening to students in class, so please do not even doubt your competence, just relax and express yourself whenever you have something to say. Finally, if you love to understand more regarding the environment and problems needed to solve to protect it from degradation, my courses can be an excellent choice for you to start with.

ZWINGMANN, Horst
Professor
Graduate School of Science

Geoscientist investigating earthquakes and timing of tectonic processes.

Horst Zwingmann joined Kyoto University in 2015 as a Professor for Geodetastics. His research involves investigation of surface tectonic processes and constraining the timing of deformation zones using isotopic dating methods.

Research introduction to students: The understanding of geological fault processes is important for numerous reasons such as regional correlation of shallow fault activity, of critical importance for the evaluation of earthquake hazards with applications for civil engineering and resources exploration (ore bodies, hydrocarbons) and in accessing suitability of waste storage sites including nuclear waste.

The recent discoveries of the Higgs boson and gravitational waves have not only corroborated earlier theoretical predictions, but opened up new avenues for research. In this course, we will sample the literature of theoretical physics, with a bias towards astrophysical topics. While this emphasis is on physical content, this will also be a good opportunity to practise English, which is indispensable in contemporary research.

A Guide to Modern Physics A-E2 (page 121)
Elementary Experimental Physics-E2 (page 126)
ILAS Seminar-E2: Topics in Frontier Physics (page 278)
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<td>H275001 Western History I-E2</td>
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<td>N366001 Basic Physical Chemistry (quantum theory)-E2</td>
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Courses with codes highlighted in red meet two periods a week for a total of 2 units.

Intensive lecture

N499001 Zoo Biology-E2
### Second semester of the 2018 academic year

Courses with codes highlighted in red meet two periods a week for a total of 2 units.

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Courses with codes highlighted in red meet two periods a week for a total of 2 units.
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<tr>
<td>ILAS Seminar-E2:The wonderful world of quantum physics (素晴らしい量子物理の世界)</td>
<td>Z002058 ILAS Seminar-E2:Agri-Food Systems in Asia (アジアにおける食農システム)</td>
<td>Z002010 ILAS Seminar-E2:First Step to Qualitative Research Methods - Field Surveys and Data Analysis (質的研究へのはじめの一歩・フィールド調査とデータ分析)</td>
<td>Z002050 ILAS Seminar-E2:The Invisible Universe (不可視の宇宙)</td>
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<td>ILAS Seminar-E2:Topics in Frontier Physics (現代物理学の最先端)</td>
<td>Z002066 ILAS Seminar-E2:Topics in social anthropology (社会人類学各論)</td>
<td>Z002041 ILAS Seminar-E2:Encounters with modern arithmetic (現代整数論との出会い)</td>
<td>Z002021 ILAS Seminar-E2:Logic, critical thinking and argument (自然科学・工学に関する論理的・批判的思考法と議論)</td>
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<td>ILAS Seminar-E2:Dams and Reservoirs (ダムと貯水池)</td>
<td>Z002040 ILAS Seminar-E2:Ethical issues in Health sciences (健康科学における倫理的課題)</td>
<td>Z002046 ILAS Seminar-E2:Programming for data analysis (データ解析のためのプログラミング)</td>
<td>Z002068 ILAS Seminar-E2:Regional Disaster Prevention (地域防災学)</td>
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<td>Z002017 ILAS Seminar-E2:Introduction to Biomedical Presentation and Debate (医学英語入門-プレゼンテーション口頭とディベート)</td>
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<td>Z002024 ILAS Seminar-E2:Urban Pest Management (都市害虫の管理)</td>
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<td>ILAS Seminar-E2:Minds and Machines- Can a Machine Think (心と機械)</td>
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Intensive ILAS Seminar-E2: Conflict Management (Global Water Issues)
## ILAS Seminars /2nd semester of the 2018 academic year

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<td>Z002049 ILAS Seminar-E2: Discussions in Biomechanics and Biophysics (バイオメカニクス・生物物理セミナー)</td>
<td>ILAS Seminar-E2: Introduction to cross-cultural communication (異文化コミュニケーション入門)</td>
<td>ILAS Seminar-E2: Critical thinking and Communication skills (批判的思考とコミュニケーション・スキル)</td>
<td>ILAS Seminar-E2: Introductory Bioinformatics (バイオインフォマティクス入門)</td>
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<td>Z002062 ILAS Seminar-E2: Introduction to robotics - a practical approach (ロボット工学入門－実践編)</td>
<td>ILAS Seminar-E2: Wearable technology (ウェアラブル技術入門)</td>
<td>ILAS Seminar-E2: Geo-Disaster Risk Reduction and Prevention (土砂災害の防災・減災学)</td>
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Liberal Arts and Sciences to learn in English 2018

Institute for Liberal Arts and Sciences, Kyoto University
Yoshida Nihonmatsu-cho Saky-ku Kyoto 606-8501

http://www.z.k.kyoto-u.ac.jp

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