

Learn on the Planet

Open online courses from Kyoto University




KyotoUx

September 2017


Contents

03 Introduction

05 Course Offerings


07  President **Juichi Yamagiwa**
Evolution of the Human Sociality


09  Professor **Motonari Uesugi**
The Chemistry of Life


11  Associate Professor **Yutaka Yamauchi**
Culture of Services


13  Professor **Haruyuki Atomi**
The Extremes of Life


15  Associate Professor **Tetsushi Ito**
Fun with Prime Numbers

17  Professor **Ryo Yamada**
Introduction to Statistical Methods for Gene Mapping

19  Associate Professor **Satoshi Kodama**
Ethics in Life Sciences and Healthcare

21  Associate Professor **Satoshi Kodama**
Ethics in Life Sciences and Healthcare - Part 2

23  Distinguished Professor **Tetsuro Matsuzawa**
Origins of the Human Mind

25  Professor **Ryoichi Yamamoto**
Stochastic Processes

27 **Media**

29 **Impact on Education at Kyoto University**
Case Studies and Voices

32 **Learning at Kyoto University**

33 **Acknowledgments**

Introduction

Since 2012, “the year of the MOOC” called by the New York Times, the MOOC -Massive Open Online Courses- have been globally expanding and progressing beyond the United States as the origin of the MOOC. Kyoto University joined edX, one of the major global MOOC providers in May 2013. Since then, with the community of the world’s leading universities, we have been actively providing high-quality online courses all over the world through edX. Since the first course “The Chemistry of Life” was provided in 2014, Kyoto University has provided ten courses of our various research fields and attracted over 130,000 learners from many countries and regions around the world (as of August, 2017). Kyoto University, as a globally leading university in diverse research fields, will also keep contributing internationally to the education.

“Learn on the Planet” gives you brief information about our fascinating online courses as well as some articles on the MOOC initiatives. All the courses are freely available. Enroll in a course you have an interest in and dive into a new world with learners from all over the world!

What is MOOC ?

MOOC (Massive Open Online Courses) is a course offered online that can be accessed for free or at low cost. A number of world leading universities and educational institutions join this open education project. Thousands or tens of thousands of people from across the world register for each course and pursue their studies by viewing lecture videos and taking assignments online. Like regular university courses, MOOC is run over a period of several weeks to several months, and certificates may be issued at the end of the period to students achieving a certain passing grade.

Since 2012, there have been many MOOC providers including edX, Coursera, FutureLearn, which are offered in English, as well as the so-called “Local MOOC” for non-English speakers such as FUN (France), MiriadaX (Spain), JMOOC (Japan).

What is edX ? What is KyotoUx ?

Kyoto University announced that it had become the first Japanese member of edX in May 2013. Founded by MIT and Harvard University, edX is a MOOC provider composed of world leading universities. Kyoto University’s courses are offered through edX under the name “KyotoUx.”

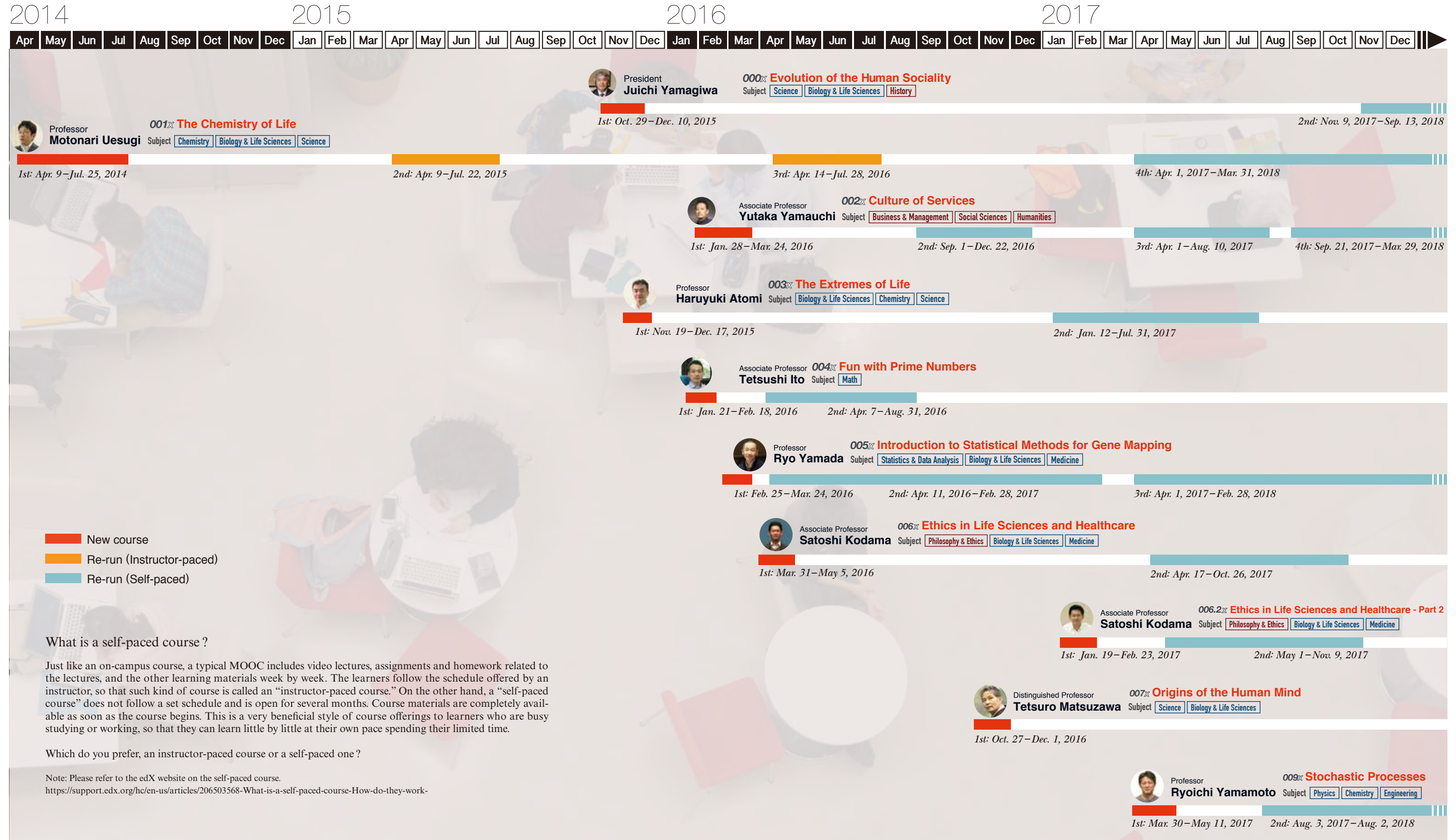
Please take the high-quality online courses by internationally famous researchers from Kyoto University. We hope the lectures will be a gate for you to be a student at Kyoto University.



www.edx.org/school/kyotoux

Course Offerings

KyotoUx has provided the following courses in 2014 – 2017.



- New course
- Re-run (Instructor-paced)
- Re-run (Self-paced)

What is a self-paced course?

Just like an on-campus course, a typical MOOC includes video lectures, assignments and homework related to the lectures, and the other learning materials week by week. The learners follow the schedule offered by an instructor, so that such kind of course is called an “instructor-paced course.” On the other hand, a “self-paced course” does not follow a set schedule and is open for several months. Course materials are completely available as soon as the course begins. This is a very beneficial style of course offerings to learners who are busy studying or working, so that they can learn little by little at their own pace spending their limited time.

Which do you prefer, an instructor-paced course or a self-paced one?

Note: Please refer to the edX website on the self-paced course.
<https://support.edx.org/hc/en-us/articles/206503568-What-is-a-self-paced-course-How-do-they-work->

EVOLUTION OF THE HUMAN SOCIALITY

A QUEST FOR THE ORIGIN OF OUR SOCIAL BEHAVIOR



京都大学 第26代 総長
山極 壽一

NOW, WE SHOULD RECONSIDER OUR EVOLUTIONARY HISTORY AND THE PATHWAY OF HUMAN SOCIALITY FOR DIRECTION OF OUR FUTURE SOCIALITY.



www.edx.org/course/evolution-human-sociality-quest-origin-kyotoux-000x



President
Juichi Yamagiwa

KyotoUx 000x
Open online courses from Kyoto University

Subject **Science** **Biology & Life Sciences** **History**

霊長類学を通じて
 Approach to the Origin of the Human Sociality Through Primatology
 人類の社会性の起源に迫る

About

Through the process of evolution, animals have developed their biological features and their cultures based on their surrounding environments. How we live our lives today is a direct result of features developed from our primate ancestors as they adapted to new environments.

In primatology, it is essential to think about how cultural development and biological natures are inseparable.

This course will help you rediscover the process of evolution and will introduce primatological studies conducted by researchers at Kyoto University, Japan. Based on carefully conducted research on primate species, we will explore the origins of human beings and provide you with examples of common similarities between human beings and non-human primates.

We will analyze basic features, such as foraging, mating, aggression, and communication from the primatological viewpoint. Furthermore, cultural and social aspects of human society, from the formation of family groups to community activities, will be considered thoroughly in comparison to those of monkeys and apes.

Our goal is to broaden your view of humans to a wider extent and think dynamically about your biology in terms of human evolution. Through acquiring knowledge of basic primatology in this course, you will establish a viewpoint to think and discuss the evolutionary process of human, and human society, in conjunction with those of our close relatives.

Period

1st Oct. 29–Dec. 10, 2015 (6 Weeks)
2nd Nov. 9, 2017–Sep. 13, 2018 (Self-paced)

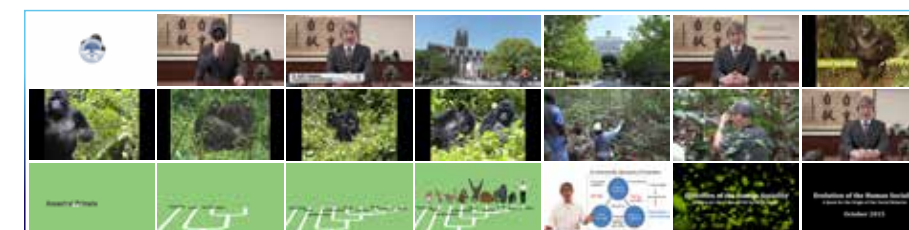
Topics

- Week 1 History & Concept of Japanese Primatology
- Week 2 What Primatologists Found on Japanese Macaques
- Week 3 The Places Where Humans and Primates Evolved
- Week 4 Food and Sex Shape Primate Sociality
- Week 5 Aggression and Society
- Week 6 Evolution of Life History Strategy


Banner



Trailer



Learner's Voice

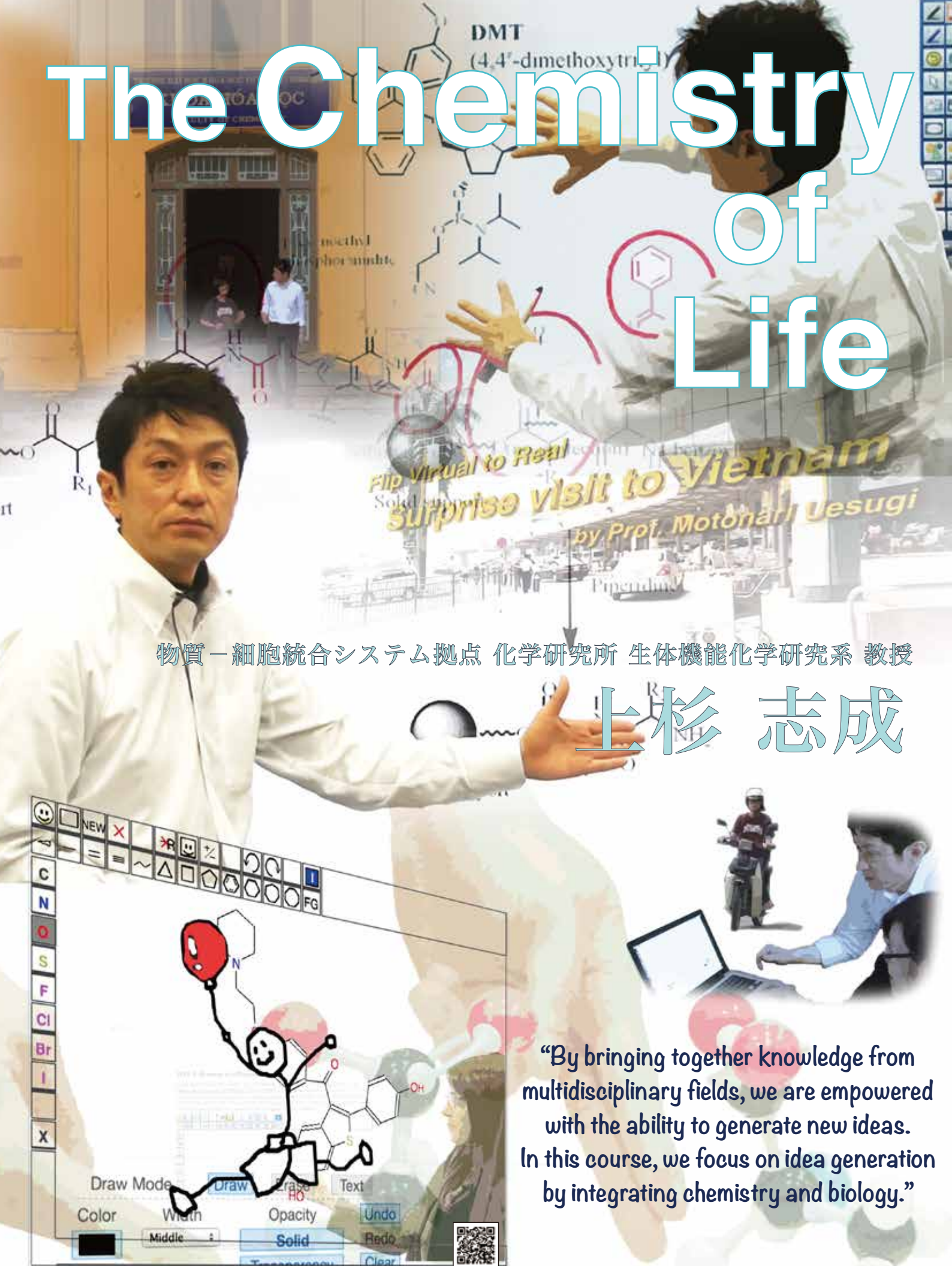
 "Just audited as the course is closed, thanks for making and offering this course and keeping the course content open!"

Message from Co-instructor

Shun Hongo
Ph.D., Postdoctoral Researcher, Section of Ecology and Evolution, Primate Research Institute

See p. 29

The Chemistry of Life



物質-細胞統合システム拠点 化学研究所 生体機能化学研究系 教授

上杉 志成

“By bringing together knowledge from multidisciplinary fields, we are empowered with the ability to generate new ideas. In this course, we focus on idea generation by integrating chemistry and biology.”

www.edx.org/course/chemistry-life-kyotoux-001x



Professor
Motonari Uesugi

Institute for Integrated Cell-Material Sciences/
Institute for Chemical Research

KyotoUx 001x
Open online courses from Kyoto University

Subject **Chemistry** **Biology & Life Sciences** **Science**

生物と化学を結びつけ、
Cultivate Your Creativity by Integrating Biology and Chemistry
発想力を磨く

About

Chemistry and biology are traditionally taught as separate subjects at the high school level, where students memorize fundamental scientific principles that are universally accepted. However, at the university level and in industry, we learn that science is not as simple as we once thought. We are constantly confronted by questions about the unknown and required to use creative, integrated approaches to solve these problems. By bringing together knowledge from multidisciplinary fields, we are empowered with the ability to generate new ideas. The goal of this course is to develop skills for generating new ideas at the interface between chemistry and biology by analyzing pioneering studies.

Period

1st Apr. 9–Jul. 25, 2014 (15 Weeks)
2nd Apr. 9–Jul. 22, 2015 (15 Weeks, Instructor-paced)
3rd Apr. 14–Jul. 28, 2016 (15 Weeks, Instructor-paced)
4th Apr. 1, 2017–Mar. 31, 2018 (Self-paced)

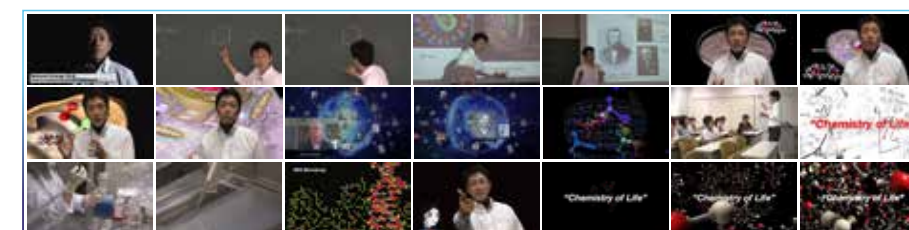
Topics

- Unit 1 Understanding Chemical Structures
- Unit 2 Writing and Synthesizing DNA
- Unit 3 DNA/RNA Applications
- Unit 4 Idea Generation Techniques
- Unit 5 Writing Amino Acids
- Unit 6 Writing and Synthesizing Proteins
- Unit 7 Combinatorial Chemistry & Chemical Genetics
- Unit 8 Fluorescent Molecules for Tracking Biology
- Unit 9 Fluorescent Proteins for Tracking Biology
- Unit 10 Review of Ideas
- Unit 11 Ideas for Fooling Sugars and Fats
- Unit 12 Ideas for Fighting against Cancer & Virus
- Unit 13 Review of Ideas



Banner



Trailer



Learner's Voice

-  “I believe this course will elevate my thinking and prepare me to do well in my future carrier. Ghana, in particular and Africa as a whole will profit from the knowledge acquired.”
-  “Is soo good and i am welcoming any courses like this one and this course is a great course that I hope to get it and i am from somalia their is no any courses or highly educations like this so am gonna saying all the best.”

Message from Learner

Hue Thi Vu
Graduate Student, Institute for Chemical Research

See p.30

Culture of Services

New Perspective on Customer Relations



“What are services?”

A wearable camera

The view from the wearable camera.

Omotenashi = おもてなし
A Japanese word for hospitality.
Wikipedia: “Omotenashi” indicates a **highly personalized service** toward guests. As seen by the **smile**, or **smile** during **Omotenashi** (greeting) through **Omotenashi** (greeting) in **Japan**, **Omotenashi** is **not** a **service** but **an attitude** toward to be of Japanese culture.

Sushi (andomori)
Sushi (andomori) is a **Japanese** **food** consisting of **vinegared** **short-grained** **rice** with **raw** or **cooked** **seafood** or **vegetables** on top of it.

Research method
Sushi (andomori) is a **Japanese** **food** consisting of **vinegared** **short-grained** **rice** with **raw** or **cooked** **seafood** or **vegetables** on top of it.

経営管理大学院 経営管理講座 准教授



山内 裕

Mr. Kenichi Hashimoto * The owner and chef of Ryozanpaku, a traditional Japanese restaurant in Kyoto

Interview

* **Mr. Hiroshi Yamaguchi**
The executive chef and general manager of Kobe Kitano Hotel

“This course is very unique and you cannot find it anywhere else. It combines several different disciplines such as management, sociology, anthropology, and philosophy.

In this course, you will learn these paradoxical characters of services by examining actual examples and developing theoretical concepts.”



www.edx.org/course/culture-services-new-perspective-kyotou-002x

“Let’s create the future of services together!”



Associate Professor
Yutaka Yamauchi

Graduate School of Management

KyotoUx 002x
Open online courses from Kyoto University

Subject **Business & Management** **Social Sciences** **Humanities**

サービスの現場を分析し、真のおもてなしを知る
What's True Hospitality? Look into Actual Services in Japan

About Customer service is a complex phenomenon where people engage in an extended interaction to co-create value. This course focuses on social and cultural aspects of services.

In this business and management course, you will learn how to analyze customer interactions, using video data taken in actual services. Through discussions of a variety of services such as sushi bars, restaurants, hotels and apparel, you will explore the nuanced and paradoxical nature of customer relations and discuss how to design services from cultural perspective.

Period

1st	Jan. 28–Mar. 24, 2016 (8 Weeks)
2nd	Sep. 1–Dec. 22, 2016 (Self-paced)
3rd	Apr. 1–Aug. 10, 2017 (Self-paced)
4th	Sep. 21, 2017–Mar. 29, 2018 (Self-paced)

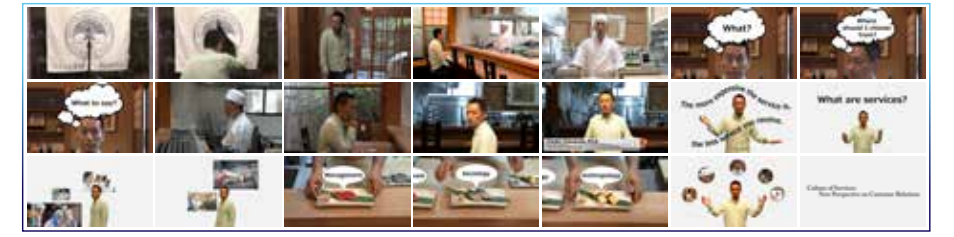
Topics

- Week 1 Introduction
- Week 2 Service Experience: Comparative Analysis
- Week 3 Ethnomethodology 1: Sushi
- Week 4 Ethnomethodology 2: Data Collection
- Week 5 Hospitality
- Week 6 Dialectical Relations
- Week 7 Variety of Services
- Week 8 Service Design

Banner



Trailer



Learner's Voice

- “This course is eye opening and providing quick view for new way to design customer services. If you are in the customer service related personnel, this course will suggest additional viewpoints which will help to create new level of the service “between” the customer!”
- “I thought the course was constructed based on the concept of business and marketing; however, I happily found that it was humanity-oriented study analyzing the core of services, or human-interaction based on contemporary philosophical and social study thinking along with scientific and logically gathered new data. The course moved on fairly quickly; still, with the thoughtful guideline by Dr. Yamauchi, I gained a great deal as I was motivated to apply my mind to it. I completed the course feeling greater reward than what I had expected at the beginning.”
- “Exceptional training! Very detailed course about “Customer Service Excellence and World Class Services.” This wonderful course aim to focus on how to understand “Customers Reactions” and “Underlying Behaviour.” This motivating course also concentrate at us as employee, how do we understand or translate “the verbal and non-verbal (body) language of our clients”? Multiple cases & scenarios are provided during the entire course: fast-food restaurant, Luxury Shop, hospitality, Michelin starred restaurant... If you are looking for High-Performance and Service Excellence to boost your professional career and exceed your clients expectations, this course is a must learn!!!!!! Love it!!!!”

Message from Co-instructor

Nao Sato
Ph.D. candidate of Graduate School of Informatics

See p.29

The Extremes of Life

Microbes and Their Diversity

工学研究科 合成・生物化学専攻生物化学講座 教授

跡見晴幸

Uridine 5'-monophosphate (UMP)

www.edx.org/course/extremes-life-microbes-diversity-kyotoux-003x



Professor
Haruyuki Atomi

Department of Synthetic Chemistry and Biological Chemistry, Graduate School of Engineering

KyotoUx 003x
Open online courses from Kyoto University

Subject **Biology & Life Sciences** **Chemistry** **Science**

極限環境微生物から
 Discover Diversity of Life Through Extremophiles
 生物多様性の仕組みを解く

About

Life on our planet is diverse. While we can easily recognize this in our everyday surroundings, an even more diverse world of life can be seen when we look under a microscope. This is the world of microorganisms. Microorganisms are everywhere, and although some are notorious for their roles in human disease, many play important roles in sustaining our global environment. Among the wide variety of microorganisms, here we will explore those that thrive in the most extreme environments, the extremophiles.

In this course, we will discover how diverse life is on our planet and consider the basic principles that govern evolution. We will also learn how we can classify organisms. Following this, we will have a look at several examples of extreme environments, and introduce the microorganisms that thrive under these harsh conditions. We will lay emphasis on the thermophiles, extremophiles that grow at high temperatures and will study how proteins from thermophiles can maintain their structure and function at high temperatures.

Period

1st Nov. 19–Dec. 17, 2015 (4 Weeks)
2nd Jan. 12–Jul. 31, 2017 (Self-paced)

Topics

Week 1 Evolution and the Diversity of Life
Week 2 Life in Boiling Water
Week 3 Diversity of Extremophiles
Week 4 Genome Sequences

Banner



Trailer



Learner's Voice

"Very interesting course with clear lectures and assignments! It is accessible to anyone whether you have no biology experience or a lot. I gained a new appreciation of the diversity of life."

"Very interesting subject. Because we are only beginning to understand the extremophiles, a course that compile all available information is a real gem. Good material and videos. I enjoyed participating."

Message from Teaching Assistant



Takahiro Shimosaka

Ph.D. candidate of Department of Synthetic Chemistry and Biological Chemistry, Graduate School of Engineering, Kyoto University

My participation as a teaching assistant for KyotoUx was a valuable experience. Students from various countries and backgrounds took the course, and discussions with them gave me an opportunity to see many different ways of thinking. Likewise, the discussions exposed the learners to the perspectives of others from all over the world. Since MOOCs are readily accessible, they provide students with a convenient way to deepen their understanding of a variety of subjects. I expect MOOCs to significantly influence the way we learn far into the future.

Fun with Prime Numbers

The Mysterious World of Mathematics

理学研究科 数学・数理解析専攻基礎数理講座 准教授

伊藤 哲史

"I invite you to the mysterious world of prime numbers."

2 3 5

13 17

3 37



Associate Professor
Tetsushi Ito

KyotoUx 004x
Open online courses from Kyoto University

Department of Mathematics, Graduate School of Science

Subject **Math**

素数の奥深い世界に
Explore the Mysterious World of Prime Numbers!

飛び込め!

About

Prime numbers are one of the most important subjects in mathematics. Many mathematicians from ancient times to the 21st century have studied prime numbers.

In this math course, you will learn the definition and basic properties of prime numbers, and how they obey mysterious laws. Some prime numbers were discovered several hundred years ago, whereas others have only been proven recently. Even today, many mathematicians are trying to discover new laws of prime numbers.

Calculating with a pen and paper, you will explore the mysterious world of prime numbers. Join us as we tackle math problems, and work together to discover new laws on prime numbers. Let's study and have fun!

Period

1st Jan. 21–Feb. 18, 2016 (4 Weeks)
2nd Apr. 7–Aug. 31, 2016 (Self-paced)

Topics

Week 1 Introduction to Prime Numbers
Week 2 Laws of Prime Numbers
Week 3 Reciprocity Laws and Mystery of Triangles
Week 4 ABC Conjecture and Beyond

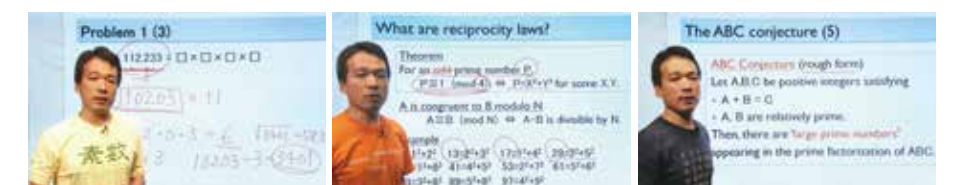
Trailer



Learner's Voice

- "This courses are very interested. providers instructor are very good.i like this courses. i haven't experienced such courses. but i like this courses."
- "Fascinating, well conducted, abstract learns much ... Very grateful, so learned and cherished moments of numerical reflection that the course allows. Not only fun with prime numbers, you learn to estimate them ..."
- "Course contents and Instructors are excellent. EDX is doing a great job in the field in education. Keep it up !!!"

Lecture Videos



Banner



Introduction to Statistical Methods for Gene Mapping

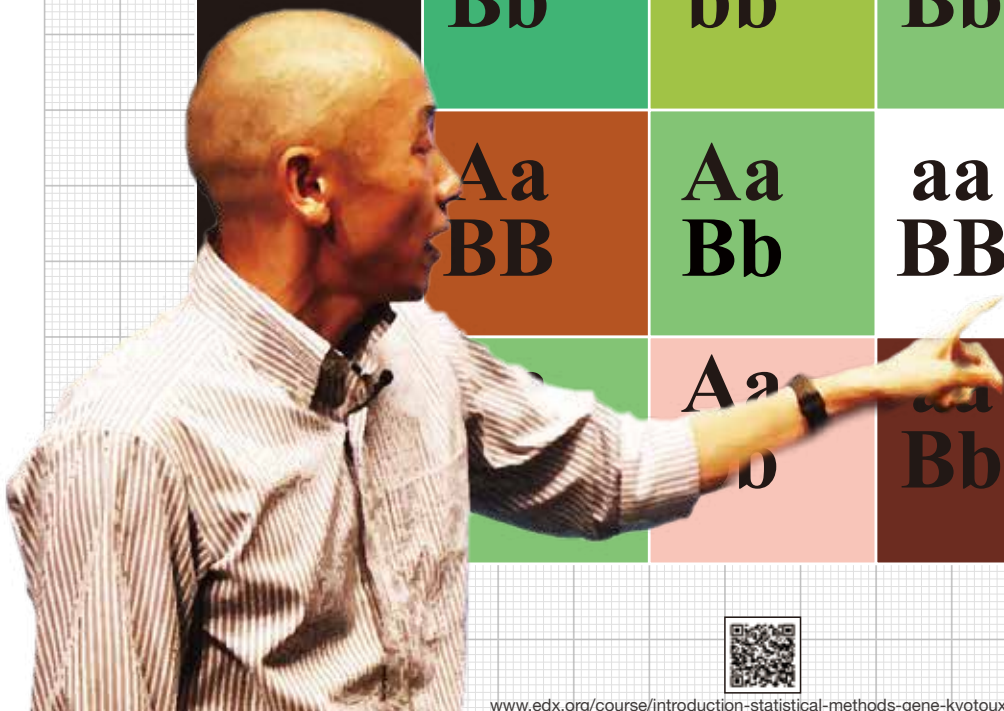
医学研究科 医学研究科附属ゲノム医学センター 統計遺伝学分野 教授

山田 亮

"We hope many students find our introductory lecture interesting and get motivated to study further

Topics in statistical genetics to understand biological heterogeneity from statistical standpoints."

	AB	Ab	aB	ab
AB	AA BB	AA Bb	Aa BB	Aa Bb
Ab	AA Bb	AA bb	Aa Bb	Aa bb
	Aa BB	Aa Bb	aa BB	aa Bb
		Aa bb	aa Bb	aa bb



www.edx.org/course/introduction-statistical-methods-gene-kyotoux-005x



Professor
Ryo Yamada

Graduate School of Medicine

KyotoUx 005x
Open online courses from Kyoto University

Subject **Statistics & Data Analysis** **Biology & Life Sciences** **Medicine**

About

This course is a primer to statistical genetics and covers an approach called linkage disequilibrium mapping, which analyzes non-familial data and has been successfully used to identify genetic variants associated with common and complex genetic traits.

We hope many students find this introductory course interesting and are motivated to study further topics in statistical genetics to understand biological variation from statistical standpoints.

Previous knowledge of molecular genetics and basic statistical concepts, such as statistical tests and estimation, is required. Basic knowledge on genetic variations is offered at the start of the course.

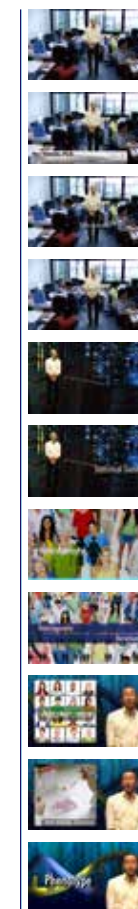
Period

1st Feb. 25 – Mar. 24, 2016 (4 Weeks)
2nd Apr. 11, 2016 – Feb. 28, 2017 (Self-paced)
3rd Apr. 1, 2017 – Feb. 28, 2018 (Self-paced)

Topics

Section 1 Basic Knowledge for Gene Mapping
Section 2 Linkage Disequilibrium
Section 3 GWAS and Multiple Testing
Section 4 Common Variants and Rare Variants

Trailer



Hello, everyone. I'm Ryo Yamada, Professor of Statistical Genetics.

Welcome to our lecture course, "Introduction to statistical methods for gene mapping," provided by unit of statistical genetics, Center for Genomic Medicine, Graduate School of Medicine, Kyoto University.

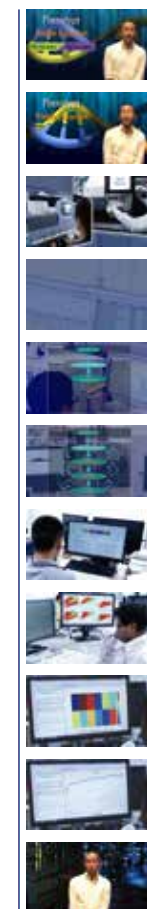
Statistical genetics is a study field to apply statistics and mathematics to understand the heterogeneity in biological phenomena in general.

The heterogeneity is one of the fundamental features in biology that we can see as the variation among various species.

And also we can see the variation among individuals in human beings.

We can see variations in appearance, but variation is also present in non-visible functions and all these features are called phenotypes.

Banner



These phenotypic variations are rooted to various patterns of protein expression, and protein's variation is based on variation in RNA expressions, and RNAs' variations are linked to DNA variation.

These days, various high-throughput experimental technologies enable us to evaluate all of these variations in multiple layers, DNA layer, RNA layer and protein layer, altogether.

And we call the approach to handle the whole sets of each layer as Genome, Transcriptome and Proteome.

When we try to understand these complex heterogeneity with large amount of data sets, or big data, statistical genetics is the "must."

Because statistical genetics provides various methods to struggle with these data sets.

We hope many students find our introductory lecture interesting and get motivated to study further topics in statistical genetics to understand biological heterogeneity from statistical standpoints.

生物多様性を解明する
Master Statistical Skills to Elucidate Diversity
統計スキルを身につける

000x

001x

002x

003x

004x

005x

006x

006.2x

007x

009x

Ethics in Life Sciences and Healthcare: Exploring Bioethics through Manga



DO YOU THINK IT IS PERMISSIBLE FOR THEM TO WITHHOLD THE NAME OF THE ILLNESS OR HOW LONG THE PATIENT HAS LEFT TO LIVE FOR THE SAKE OF THE PATIENT?

文学研究科 思想文化学専攻 思想文化学講座 准教授
児玉 聡



THIS IS THE QUESTION OF WHETHER OR NOT IT IS ACCEPTABLE TO LIE TO PATIENTS FOR THEIR OWN GOOD. FIRST, LET'S LOOK AT THE POSITION THAT ONE SHOULD NOT LIE.



2. Pros & Cons of Cancer Disclosure

Pros: One should not lie.
• Tell them the truth so that they can live their last days to the fullest.
• Probably the patient knows the truth even if he/she is deceived.



漫画を通じて考える
Consider and Discuss Informed Consent, Enhancement, etc. Through Manga
がん告知・ドローピング

Associate Professor
Satoshi Kodama

Graduate School of Letters

KyotoUx 006x
Open online courses from Kyoto University

Subject **Philosophy & Ethics** **Biology & Life Sciences** **Medicine**

About

Is it okay to take pills to help you ace exams? Should you be able to choose the sex of your child? Is abortion murder?

These controversial questions will be explored through Manga in this bioethics course. Bioethics is an interdisciplinary field of study that looks into ethical, legal, and social implications of life sciences and health care.

This course will help you understand key ethical issues surrounding crucial problems that profoundly impact your life from birth to death.

Period

1st Mar. 31–May 5, 2016 (5 Weeks)
2nd Apr. 17–Oct. 26, 2017 (Self-paced)

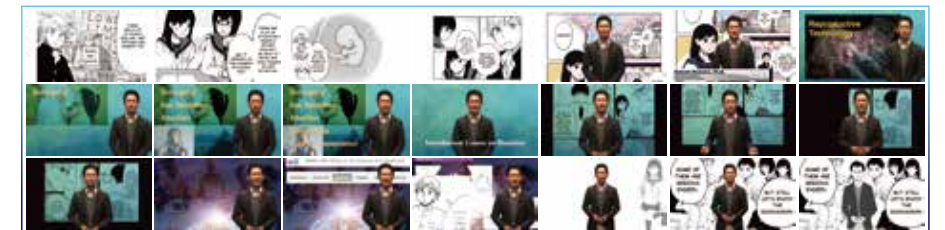
Topics

Week 1 The Ethics of Assisted Reproductive Technology
Week 2 The Ethics of Truth-Telling
Week 3 Is Abortion Murder?
Week 4 What's wrong with Enhancement?
Week 5 Is Euthanasia Wrong?

Banner



Trailer



Lecture Videos



Reference



Japanese version
www.kagakudojin.co.jp/book/?book_no=106172

Title: マンガで学ぶ生命倫理
Manga de manabu seimeirinri

Publisher: 化学同人 (Feb. 10, 2013)
Kagaku-Dojin Publishing Company, INC

Author: Satoshi Kodama
Manga: なつたか Natsutaka



www.edx.org/course/ethics-life-sciences-healthcare-kyotou-006x

Ethics in Life Sciences and Healthcare: Exploring Bioethics through Manga

Part 2

IF YOU COULD MAKE USE OF
CLONING TECHNOLOGY
WHEN YOUR FAVORITE PET OR
A BELOVED MEMBER OF YOUR FAMILY DIED,
WHAT WOULD YOU DO?

文学研究科 思想文化学専攻 思想文化学講座 准教授
兎玉 聡

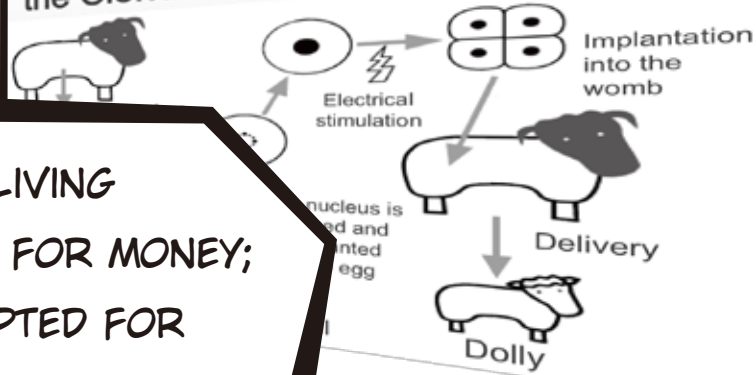


Possibility of Cloning humans

The success of somatic cell cloning

IT IS ACCEPTED FOR LIVING
DONORS TO DONATE BLOOD FOR MONEY;
THEN, WHY ISN'T IT ACCEPTED FOR
THEM TO DONATE ORGANS FOR MONEY?

The Birth of Dolly,
the Cloned Sheep in UK in 1996



www.edx.org/course/ethics-life-sciences-healthcare-kyotoux-006-2x



Associate Professor
Satoshi Kodama

Graduate School of Letters

KyotoUx 006.2x
Open online courses from Kyoto University

Subject **Philosophy & Ethics** **Biology & Life Sciences** **Medicine**

漫画を通じて考える
脳死・クローン人間、etc. Through Manga

About Is it permissible to create human clones? Would you really want to live forever? Is brain death the death of a human being?

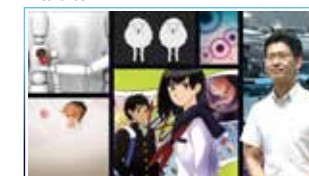
These controversial questions will be explored through stories in Manga in this bioethics course. Bioethics is an interdisciplinary field of study that looks into ethical, legal, and social implications of life sciences and health care.

This course will help you understand key ethical issues surrounding crucial problems that literally impact your life from birth to death.

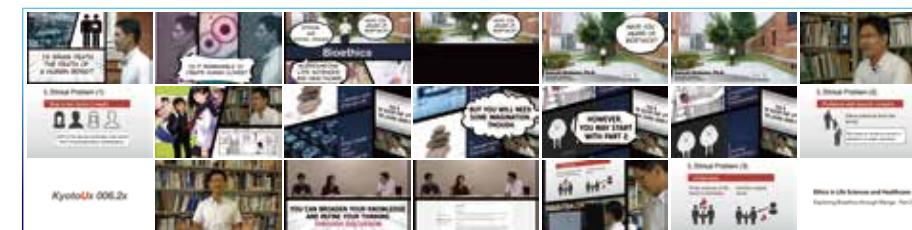
Period 1st Jan. 19–Feb. 23, 2017 (5 Weeks)
2nd May 1–Nov. 9, 2017 (Self-paced)

Topics
Week 1 Living-Donor Organ Transplantation
Week 2 Cloning Technology
Week 3 ES Cells and iPS Cells
Week 4 Lifespan and Eternal Life
Week 5 Brain Death and Organ Transplants

Banner



Trailer



Message from
Teaching Staff

Reina SAIJO

Ph.D., Teaching Fellow at Faculty of Letters

By engaging in this lecture as a member of the course team, I could have a lot of interesting experiences. It was the most fruitful thing for me to know opinions of the learners from many countries and regions with various background and have an opportunity to communicate with them. Above all, as for bioethical issues dealt with in this course, their solutions adopted in the final stage are variant depending on individuals' value systems and social situations. In this sense, I could learn a lot about, for example, medical staff's struggles for patients demanding paternalistic treatments and differences of abortion laws between some countries. Also, I was delighted as a staff to see a lot of motivated learners actively discuss on the forum.

Before the course started, I had been much concerned that someone might be grieved at the discussions and grading in peer review assignments as the course contents included many topics related to the individuals' value systems. Communication by text may cause aggressive behaviors with less information about the speakers. Fortunately, my concern proved unfounded. As I mentioned above, the discussions between the learners were active, and they showed sincere attitudes each other. It may be because the course was offered through the university, but still I reflect that I should have trusted every learner more.

What impressed me was that all the learners shared a common sense that they should respect each other's autonomous decisions of their opinions even though they all have different backgrounds. Of course, there are actually few people who have ultimate confidence in their own judgment, and we may have many cases that we have no choice but to take influences on someone close into consideration. But still, there is a trend to think immediately that opinions on values are various and subjective. Despite this trend, I could see a process of forming agreements through consideration and discussion, which was a very valuable experience. I really appreciate all the learners as well as the production staff.

Origins of the Human Mind

高等研究院 特別教授
松沢 哲郎

“What Does It Mean To Be Human?”

www.edx.org/course/origins-human-mind-kyotoux-007x



Distinguished Professor
Tetsuro Matsuzawa

KyotoUx 007x
Open online courses from Kyoto University

Kyoto University Institute for Advanced Study/
Primate Research Institute

Subject [Science](#) [Biology & Life Sciences](#)

チンパンジーとの比較から
Know about Humans in Comparison with Chimpanzees
人間を知る

About The human mind is an evolutionary product, just like the body. However, the mind does not remain in fossil form like bones and teeth. Therefore, to better study and understand our minds and their evolutionary origins we need to compare our cognitive features with those of different living primates. This approach is called “Comparative Cognitive Science (CCS).” The CCS is a unique combination of psychology and primatology. It tries to give answers to fundamental questions such as “what is uniquely to human?”, “where did it come from?”, “how did we get here?”, and “where do we go?” This intensive course focuses on chimpanzees, the closest relatives of humans.

This course covers selected areas of current research on the CCS. We focus on behavioral studies of nonhuman animals, especially chimpanzees. Since the chimpanzee and the human share the latest common ancestor only about five million years ago, this great ape provides the key to understanding our nature.

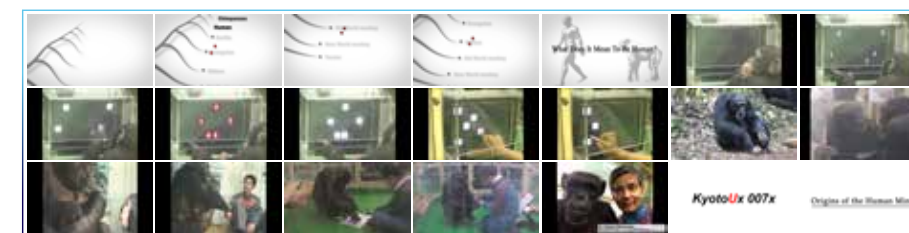
Period 1st Oct. 27–Dec. 1, 2016 (5 Weeks)

Topics
Week 1 Introduction to Primate World
Week 2 Matsuzawa Methodology
Week 3 Imitation and Language
Week 4 Stable Supine Posture and Imagination
Week 5 Green Corridor Project as a Conservation Practice

Banner



Trailer



Learner's Voice

“This is a short course, but a great overview of primates, and especially chimpanzees. You'll learn the result of decades of work, and learn interesting things on how do chimpanzees think, what do they like to do, how they imitate or learn to count, and learn about how to protect them. The lectures have embedded videos of real-life experiments, and it's great to watch them and learn about them from someone's own experience. All in all, I'm looking forward to a possible sequel.”

“This course offers an introduction to the human ancestry, how the primates brains work and how have we evolved over thousand of years of existence. We get insights through the experiments and researches with primates (specifically chimpanzees) of the professor Tetsuro Matsuzawa. In four weeks you will learn about differences between the primates, the thinking behaviour of them, always compared to humans.”

Message from Learner

Hiroya Takiyama
Graduate Student, Section of Language and Intelligence,
Primate Research Institute

See p.30

Stochastic Processes

Data Analysis and Computer Simulation

Simulated trajectory of a Brownian particle

Superposition of 1,000 trajectories with different sets of random forces

Stochastic process

And also,

$$S_y(\omega) = \int dt e^{i\omega t} \varphi_y(t)$$

Wiener-Khinchine theorem:

$$\varphi_y(t) \xleftrightarrow{\text{inverse Fourier Eq. (14)}} S_y(\omega) \xleftrightarrow{\text{Fourier Eq. (15)}}$$

Sum rules:

$$\varphi_y(0) = \frac{1}{2\pi} \int d\omega S_y(\omega)$$

$$S_y(0) = \int dt \varphi_y(t)$$

Stochastic Processes: Data Analysis and Computer Simulation

"I hope you will be attracted to the interesting phenomena taking place in the microscopic world of molecules."

工学研究科化学工学専攻化学工学基礎講座

山本 量一



www.edx.org/course/stochastic-processes-data-analysis-kyotoux-009x



Professor
Ryoichi Yamamoto

Department of Chemical Engineering,
Graduate School of Engineering

KyotoUx 009x
Open online courses from Kyoto University

Subject Physics Chemistry Engineering

複雑な現象をコンピュータシミュレーションで捉える

About

The motion of falling leaves or small particles diffusing in a fluid is highly stochastic in nature. Therefore, such motions must be modeled as stochastic processes, for which exact predictions are no longer possible. This is in stark contrast to the deterministic motion of planets and stars, which can be perfectly predicted using celestial mechanics.

This course is an introduction to stochastic processes through numerical simulations with a focus on the proper data analysis needed to interpret the results. We will use the Jupyter (iPython) notebook as our programming environment. It is freely available for Windows, Mac, and Linux through the Anaconda Python Distribution.

You will first learn the basic theories of stochastic processes. Then, you will use these theories to develop your own python codes to perform numerical simulations of small particles diffusing in a fluid. Finally, you will analyze the simulation data according to the theories presented at the beginning of course.

At the end of the course, we will analyze the dynamical data of more complicated systems, such as financial markets or meteorological data, using the basic theory of stochastic processes.

Period

1st Mar. 30–May 11, 2017 (6 Weeks)
2nd Aug. 3, 2017–Aug. 2, 2018 (Self-paced)

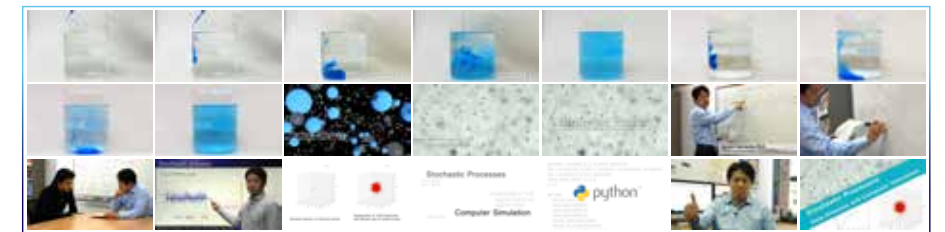
Topics

- Week 1 Python Programming for Beginners
- Week 2 Distribution Function and Random Number
- Week 3 Brownian Motion 1: Basic Theories
- Week 4 Brownian Motion 2: Computer Simulation
- Week 5 Brownian Motion 3: Data Analyses
- Week 6 Stochastic Processes in the Real World

Banner



Trailer



Message from Co-instructor



John J. Molina
Assistant Professor

When Professor Yamamoto asked me if I would be interested in helping him deliver his KyotoUx course on "Stochastic Processes" I thought it would be an interesting exercise, but I did not anticipate that I would learn so much about the subject while we were preparing the course. I studied most of the material during my own undergraduate courses, a little over ten years ago, but I did this without using any numerical calculations. I now believe this is a huge handicap, because numerical simulations allow you to tackle much more complicated and interesting problems than you can reasonably solve using just pen and paper. A sound theoretical understanding is of course still necessary, but once you understand the problem, you are (possibly) just a few lines of Python code away from the answer. I believe this was Professor Yamamoto's inspiration when developing this course. The theory of "Stochastic Processes" can seem arid and abstract when first introduced, and for non-physicists the study of Brownian motion is probably not very appealing, but the same framework can be used to describe stock markets or population dynamics. Studying the topic with the aid of computer simulations allows one to easily "see" what is happening, and how the different assumptions and parameters affect the behaviour of the system. I hope this course will provide a stepping-stone for students around the world to start using the tools of statistical mechanics to understand the world around them.

KyotoUx initiatives have been featured in a number of domestic and international media outlets.



www.kyoto-u.ac.jp/static/ja/news_data/hv1/news7/2013/130521_1.htm

May 21, 2013

Press Conference

日本で最初に edX のコンソーシアムに参加しました。
(Kyoto University joined the edX consortium as the first university in Japan.)

Research Activities 2013

Bringing the Higher Education to Students around the World

“Kyoto University has joined edX (<http://www.edx.org>), the international consortium of 27 prestigious universities—including the two founding institutions, Harvard and MIT—that offers free online courses (as known as MOOCs: Massive Open Online Courses) as the first Japanese university. The consortium has approximately 900,000 registered students from around the world who are able to take any of the over 60 courses that edX is currently providing.”

www.kyoto-u.ac.jp/en/research/international/publications/documents/ra2013-11.pdf



www.icems.kyoto-u.ac.jp/e/pr/2013/05/21-nr.html

Institute for Integrated Cell-Material Sciences, Kyoto University
Topics / News Releases

**Kyoto University Joins edX:
Motonari Uesugi to Teach First Course
"The Chemistry of Life"**

“Kyoto University announced on May 21 its alliance with “edX,” making it the first Japanese university to take part in the non-profit educational consortium created by founding partners Harvard University and Massachusetts Institute of Technology (MIT) in 2012.”



www.icems.kyoto-u.ac.jp/e/pr/2014/05/07-tp.html

May 7, 2014

Institute for Integrated Cell-Material Sciences, Kyoto University
Topics / News Releases

**Professor Uesugi's edX Online Course
"The Chemistry of Life" Begins**

“After announcing an alliance with edX in May 2013, Kyoto University officially plunged into the world of massive open online courses on April 10, 2014 when it launched “The Chemistry of Life,” taught by iCeMS Professor Motonari Uesugi.”



www.icems.kyoto-u.ac.jp/e/pr/2014/07/14-tp.html

Jul. 14, 2014

Institute for Integrated Cell-Material Sciences, Kyoto University
Topics / News Releases

**Kyoto University Invites Top Performing edX Students
to Japan**

“Kyoto University rewarded the top six performing students enrolled in its online Extenal LinkedX course, titled “The Chemistry of Life,” with all-expense-paid visits to Japan.”



www.kyoto-u.ac.jp/en/about/events_news/department/koutou/news/2015/150708_1.html

Oct. 13, 2015

edX blog

**Why the President of Kyoto University
Decided to Teach an edX MOOC**

“Join Juichi Yamagiwa, President of Kyoto University in *Evolution of Human Sociality: A Quest for the Origin of Our Social Behavior* starting on October 29. This first-ever course, taught by a sitting president from one of edX’s member universities, explores the roots of human society through the lens of primates.”



blog.edx.org/win-a-primatology-research-trip-to-kyoto-university?track=blog



blog.edx.org/why-the-president-of-kyoto-university-decided-to-teach-an-edx-mooc

Oct. 27, 2015

edX blog

Win a Primatology Research Trip to Kyoto University!

“The upcoming Kyoto University course *Evolution of the Human Sociality: A Quest for the Origin of Our Social Behavior* on edX has already been attracting attention, and will be offered by the President of Kyoto University, a world-leading primatologist himself!”

Mar. 10, 2016

edX blog

Kyoto University Invites Student Winners to Japan

“Kyoto University previously announced a competition for learners in their *Evolution of the Human Sociality: A Quest for the Origin of Our Social Behavior* course. Read on to learn about the winners of the competition and their trip to Japan.”



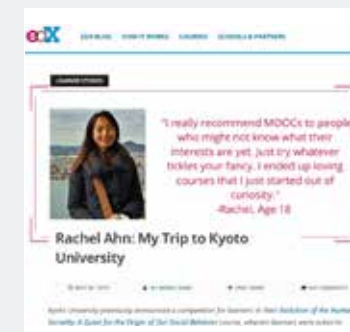
blog.edx.org/kyoto-university-invites-student-winners-to-japan?track=blog

May 6, 2016

edX blog

Rachel Ahn: My Trip to Kyoto University

“Kyoto University previously announced a competition for learners in their *Evolution of the Human Sociality: A Quest for the Origin of Our Social Behavior* course, wherein learners were asked to submit a research proposal as a coursework assignment. Two winners were selected, and won an all expense paid trip to Kyoto University. Rachel Ahn was one of the winners.”



blog.edx.org/rachel-ahn-learner-story?track=blog



Here is a part of them.

Impact on Education at Kyoto University

Case Studies and Voices

000x Evolution of the Human Sociality President Juichi Yamagiwa



Shun Hongo as a co-instructor

Ph.D., Postdoctoral Researcher, Section of Ecology and Evolution, Primate Research Institute

My best experience in creating KyotoUx course materials is to make questions about a developing academic field and to discuss their answers seriously with the learners from all over the world. The primatology is a quite young academic field which has been studied for about 60 years. So, the hypotheses that assume the trajectory of human social evolution based on societies and ecology of primates greatly depend on each researcher. However, because the course should provide questions with correct answers, I tried considering and making them to avoid any inconsistency. But some questions and contradictions that I had not expected at first did arise and were presented on the Discussion page when about 300 learners had considered and

solved the questions. When reading their comments, I could feel that all the learners really wanted to understand, and that I should respond to them carefully and thoughtfully. At that time when I was a graduate student, I did not expect that such kind of “real” discussion would be going on in the MOOC as it is not face-to-face learning. It was a very pleasant surprise to me and I could learn a lot from the experience.



002x Culture of Services Associate Professor Yutaka Yamauchi



Nao Sato as a co-instructor

Ph.D. candidate of Graduate School of Informatics

It was a very good experience for me to join an initiative of MOOC for the first time by giving a lecture for one of the 8-week course. The KyotoUx course “Culture of Services,” offered by Associate Professor Yamauchi and me, stimulates a conventional concept of “service.” Our basic idea may be new and difficult, but you can view the lecture videos as many times as you want, so that you can understand much better through the MOOC than a usual on-campus lecture. In addition, the learners’ comments from all over the

world helped us review our research objectively. Through this experience, I could realize massive potential in “online learning” again.



001x The Chemistry of Life Professor Motonari Uesugi



Hue Thi Vu as a learner

Graduate Student, Institute for Chemical Research

Chemistry of Life is an interesting science course. It's easy to follow but very informative at the same time. It's great for a chemistry student like me who wants to learn more about Biology. The contents are very interesting, especially the topic on idea generation technique. The way Prof. Uesugi delivered the lessons are also very intriguing.

I am doing my graduate study in the Chemical Biology laboratory of Prof. Uesugi. It's one of the best Chemical Biology research groups, which has been providing me with a very good condition to do my research. I will be finishing my Master study by next April and will continue to the Ph.D. course.

I came to Japan to pursue graduate study in Chemical Biology. With the recommendation from Prof. Uesugi, I got supported by the Japanese government with MEXT scholarship.



007x Origins of the Human Mind Distinguished Professor Tetsuro Matsuzawa



Hiroya Takiyama as a learner

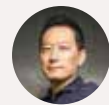
Graduate Student, Section of Language and Intelligence, Primate Research Institute, Kyoto University

What is a human? – an intriguing question many people attempt to solve. Comparative Cognitive Science (CCS), we learned through this course, is the research that focuses on this question. The course was set up in a sophisticated way. First, it explained why we should study primates. It is important for us to answer the aforementioned question in a scientific way. Second, we were taught how to study CCS. Usually, we tend to think results as the most important part in research. However, methodology is indeed essential. We should not believe everything we are told but think by ourselves. Third, we learned the interesting works done by the professor and his colleagues. What is the

difference between humans and other apes? What is the unique point of a human? Focusing on these questions allows us to understand humans well. At the end of this course, we also got to know more about conservation of chimpanzees. A lot of primates including chimpanzees are now endangered, and it is necessary for us to start paying attention and take action their conservation. Conservation is not easy, but we should not give up just because it is difficult. I enjoyed this course a lot with all the precious knowledge lectures shared with. If you haven't tried yet, I strongly recommend you to join us.

Learning at Kyoto University

Messages from Instructors



Associate Professor **Yutaka Yamauchi** 002x **Culture of Services**

I use the MOOC in several regular courses in Kyoto University. I require students to take the MOOC prior to classroom discussions and then to prepare presentation on the covered materials. I provide additional reading materials and assignments. My MOOC is quite accessible to a broad audience because of the familiar theme to most people, namely service. I use it in my undergraduate course “Service Management” and students have no problem grasping the ideas. At the same time, because its academic content is quite advanced, I can use the MOOC for my graduate course “Advanced Service Design.” The value of MOOC is beyond reducing time to deliver standard parts of the course. MOOC materials are carefully designed and structured so that learning is optimized; I had never spent so

much time on preparing for lectures before this MOOC. The students can quickly gain important ideas but also repeatedly review the segments of video lectures to clarify and deepen their understanding. Furthermore, my MOOC contains various video data of actual service settings. It is helpful for the students to go over the video data and analyze them on their own prior to classroom discussion; this is much more effective than reading business cases. Finally, classroom discussions can delve into deep theoretical topics because the students have learned much prior to the sessions. Having intensive discussions with students who have prepared well is a truly rewarding experience for an instructor.



Associate Professor **Tetsushi Ito** 004x **Fun with Prime Numbers**

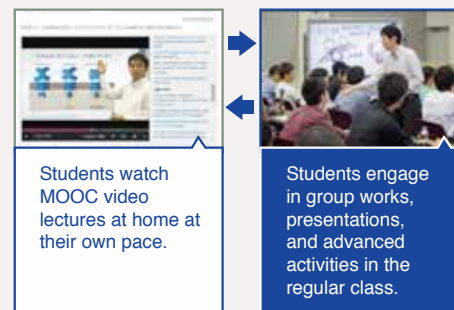
It was an exciting experience for me to give KyotoUx course 004x “Fun with Prime Numbers.” I think a good thing of edX’s platform is, thanks to its well-organized system and the support of our staffs, students can share the atmosphere of the lecture room. Each week, immediately after the video became available, many students posted messages to BBS; some were simply chatting about their impressions, some were asking questions, and some were pointing out a serious flaw which I had to correct. Though it is online, I think they could have a feeling of learning together in the lecture room. This feeling is very

important because it gives motivation to learn new topics. Also, I was surprised how MOOC is really ‘massive’. Without MOOC, I could not imagine several hundred students from more than 100 countries were taking the same course at the same time. Because mathematics is a widely-studied subject of science, I think more people from all over the world can have a chance to learn it together by MOOC. Currently, I am preparing a new course titled “More Fun with Prime Numbers.” I will revise the contents and add more topics. The new course number will be 011x. (11 is a prime number.)

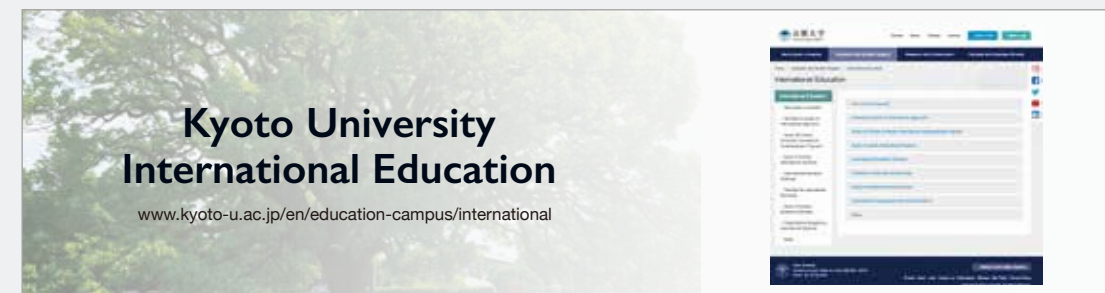
Report

The created MOOCs enable various educational development. For example, they can be used as preparation and supplementary materials for on-campus classes at Kyoto University as well as in other international universities. Professor Motonari Uesugi, who has offered “The Chemistry of Life,” has kept using his MOOC for his on-campus class “Organic Chemistry of Life” as a flipped classroom every year since 2014. He told us that he could find a big merit of the online course that he could spare most time for group work, presentation and discussion in his class because his students took his online course prior to and outside of class, and that he could implement such flipped classrooms with the MOOC offered in English at the universities in and outside of Japan.

Professor **Motonari Uesugi**
001x **The Chemistry of Life**



The courses that stimulate your curiosity through edX are only a part of what Kyoto University offers. If you want to deepen and widen the content you have learned in edX, let's study together at Kyoto University. We are creating a great environment as an international educational institution and working on international collaborative education programs including JGP, for example. Kyoto University welcomes international students from around 100 countries and regions throughout the world. For details, please refer to the following URLs.



Let's travel around the academic world with our colleagues!



Learn on the Planet

Open online courses from Kyoto University

KyotoUx

Edited by
KyotoUx

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