

# Faculty of Economics Graduate School of Economics

# Activities by Faculties and Graduate Schools

ASEANで活動する部局/活動紹介



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## About Us

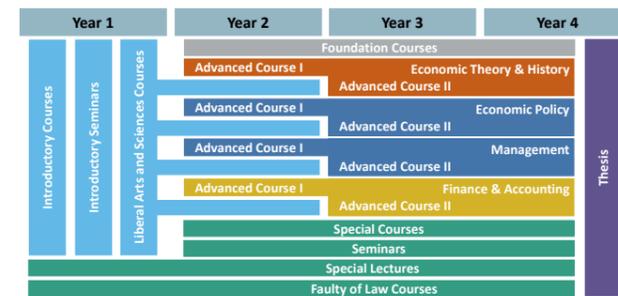
Founded in 1919, the Faculty of Economics is one of the oldest faculties of its kind in Japan. Our successive generations of faculty members, each endowed with tremendous personality, have carried out unique and innovative research. More than 1,000 students are currently enrolled in the Faculty of Economics, which offers a systematic curriculum that builds a deep level of expertise accumulated as students progress from introductory to advanced courses, as well as a broad interdisciplinary approach as classes are categorized into four concentrations and students have the flexibility to enroll in courses in related disciplines.

Our graduate school, established in 1953, is host to more than 250 master's and doctoral students, and some 100 international students. Through course work, participation in seminars, and supervised research, graduate students are taught to conduct theoretical and empirical analysis at the highest levels. In 2009, we launched the International Graduate Program for East Asia Sustainable Development Studies and we have since welcomed more than 50 new international students. We at the Graduate School of Economics and Faculty of Economics value diversity, and our doors are always open to students who are endowed with an abundance of humanity and creativity.



## Faculty of Economics

The faculty's educational mission is to cultivate individuals who are capable of applying specialized knowledge to tackle complex challenges in our contemporary economy and society; prepared to contribute to harmonious coexistence in the global community; and filled with a great deal of compassion, sensitivity to human rights, and integrity to advocate for fairness.

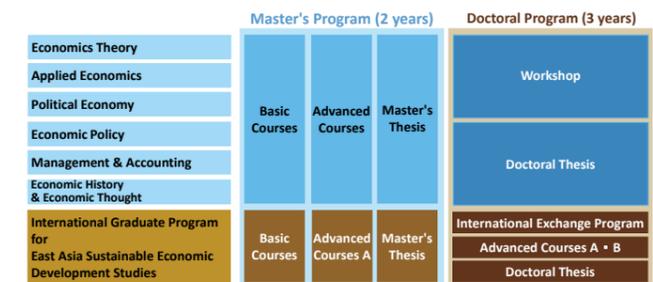


The Faculty of Economics offers four concentrations: Economic Theory & History, Economic Policy, Management, and Finance & Accounting. Students are able to develop specializations through study in accordance with structured curriculum models. This is a flexible system, under which students achieving excellent grades in each concentration are accredited for its completion. Regular courses in the Faculty are divided into the categories of Introductory Seminars, Introductory Courses, Foundation Courses, Advanced Courses I, Advanced Courses II, Faculty of Law Courses, and Special Lectures, and are basically organized so as to enable incremental learning.

## Graduate School of Economics

The graduate school's educational mission is to cultivate specialists who are capable of applying insights, knowledge, and techniques based on economics to tackle complex challenges in our contemporary economy and society; prepared to contribute to the global community; and filled with a great deal of compassion, sensitivity to human rights, and integrity to advocate for fairness.

- The Master's program is made up of Basic Courses, Advanced Courses, and Special Lectures. It has six concentrations that provide curricular models indicating which basic courses are recommended and which advanced subjects are associated with each concentration.
- In the Doctoral program, the Doctoral Dissertation Committees comprising two or more faculty members for each student provide individual supervision to ensure that students are able to complete their dissertations in three years. Workshops are also organized to provide students with opportunities to present their research-in-progress and to foster high-level discussion and productive interaction.



# International Graduate Programme for East Asia Sustainable Economic Development Studies

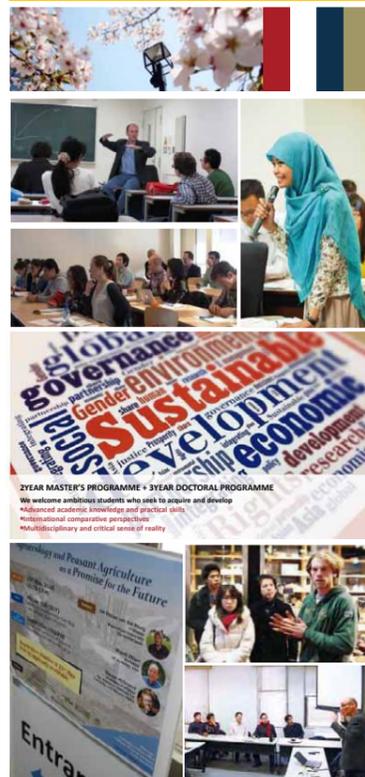
## Programme Description

EA programme is designed to provide international students with both advanced academic knowledge and practical skills. It consists of a two year Master's programme and a three year Doctoral programme, both starting from October. Our students are from a variety of countries including China, South Korea, Indonesia, Thailand, Malaysia, Philippines, Vietnam, Germany, Romania, Italy, Turkey, Egypt, UK, USA, Mexico and Japan. The programme is offered in English, and Japanese language skills are not required at the time of admission.

- The Master's programme offers both core and advanced courses through which students can enjoy a comprehensive curriculum.
- The Doctoral programme offers Overseas Field Research and International Graduate Student Workshop subjects through which students further develop a deep understanding of the current issues in East Asia.

In addition to classes designed specifically for this programme, students will participate in selected courses at the Graduate School of Economics as well as other graduate schools. Students will develop academic knowledge and practical skills in international setting. We offer many opportunities to conduct field research at diverse sites such as large manufacturing plants and small factories, cutting-edge businesses and rural farming communities throughout East Asia so that students can develop a multidisciplinary and critical sense of reality. These are all needed to contribute to sustainable development in East Asia as academic researchers, government officials, or social entrepreneurs.

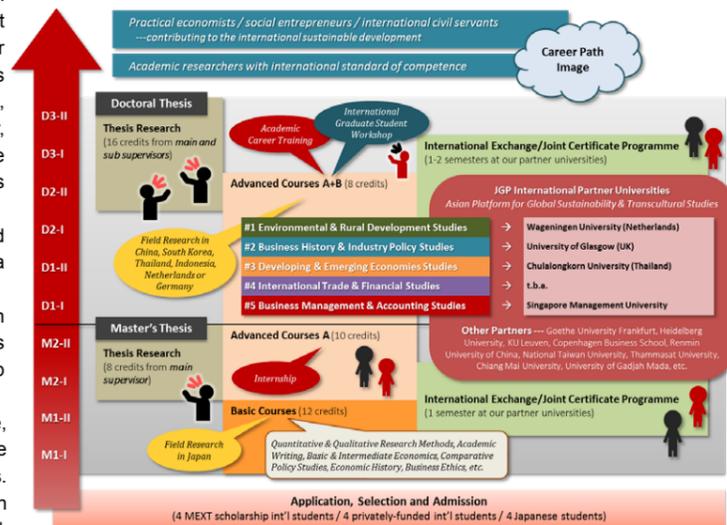
## Five Tracks (Specialisations) in EA Programme



EA Programme has the following five tracks (specialisations) according to their main areas of study and theoretical and methodological orientations. Students must choose one after consultation with the EA Programme Committee, but which specialisation students can and should take depends largely on their academic background as well as their supervisors.

Regarding the list of courses offered in each specialisation, there is no strict regulation apart from some recommended curriculum models and course works. Instead, each specialisation has one or two international partner universities. Students are given an opportunity to take part in an exchange programme and receive joint supervision with some of these partner universities.

- |   |  |
|---|--|
| <b>Environmental Policy &amp; Rural Development Studies</b> | 1) The objective of the track #1 is to provide an in-depth and comprehensive understanding of the dynamics and processes of sustainable development in the environmental, economic, social and political spheres with a keen focus on the governance of energy, food and natural resources.  |
| <b>Business History &amp; Industry Policy Studies</b>       | 2) The objective of the track #2 is to nurture a comprehensive capability to contextualize the significance of actors, events, and institutions in the past and present systematically.  |
| <b>Developing &amp; Emerging Economies Studies</b>          | 3) The track #3 aims to raise experts in developing and transition economies studies with sophisticated knowledge and skills in Economics, including Econometrics. Furthermore, an ideal expert in developing and transition economies studies, as envisaged by this course, should have excellent skills to obtain insightful findings through field surveys. |
| <b>International Trade &amp; Financial Studies</b>          | 4) The objective of the track #4 is to provide essential knowledge in international economics and to develop students' research skills in international economics and related fields. Emphasis is placed on the advanced level of theoretical and empirical studies in international trade and finance.  |
| <b>Business Management &amp; Accounting Studies</b>         | 5) The track #5 on business management and accounting sets its ultimate goal to educate students to be well equipped with the latest knowledge in business management and accounting that suits their individual and different carrier goals.  |

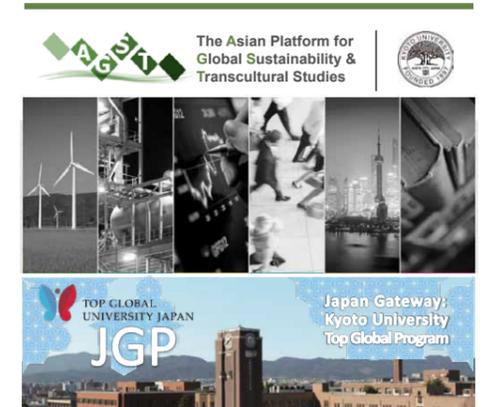


# The Asian Platform for Global Sustainability & Transcultural Studies (AGST)

## Aims and Outline

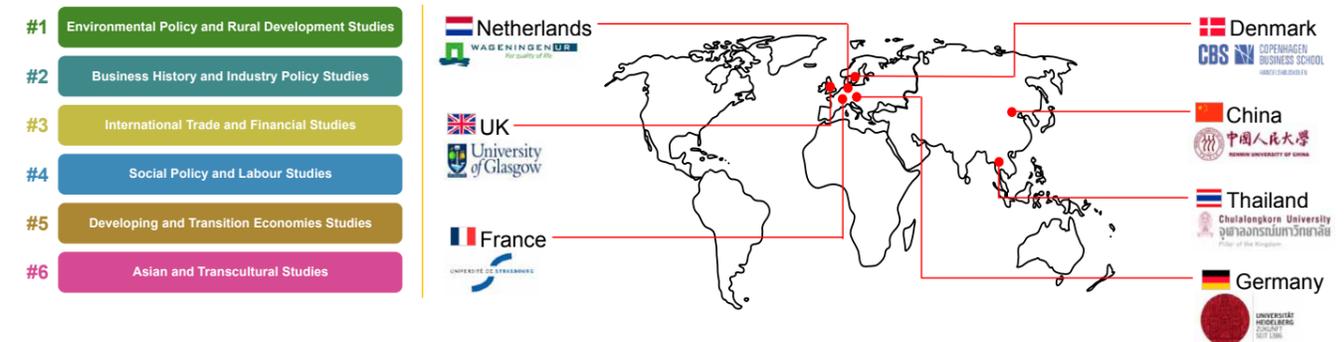
The Asian Platform for Global Sustainability & Transcultural Studies (AGST) has been established in order to cultivate globally minded individuals with the capacity to contribute to sustainable development in Asia and throughout the world. It forms part of the discipline of social sciences and humanities under the "Japan Gateway: Kyoto University Top Global Program" and involves the three Graduate Schools of Economics (GSE), Letters (GSL) and Agriculture (GSA: Division of Natural Resource Economics).

World-leading researchers from partner institutions will be invited to collaborate on the development of teaching materials for AGST. These materials will then be used in the teaching of new jointly implemented courses, which, together with pre-existing programmes (e.g. EA Programme), will be part of an expanded cross-credit scheme. This educational structure will provide the basis for development of joint/double degree programmes with partner institutions. The inclusion of courses offered in the "Studying Japan and Asia in Kyoto" programme under the Kyoto University Asian Studies Unit (KUASU) will ensure that students coming to Kyoto University from partner institutions can select from a variety of study options, at the same time as expanding the opportunities for Kyoto University students enrolling in the courses, and providing a platform for the development of the next generation of cross-disciplinary research.



## Six Modules and Partner Institutions

AGST offers a programme of six modules: (1) Environmental policy and rural development studies; (2) Business history and industry policy studies; (3) International trade and financial studies; (4) Social policy and labour studies; (5) Developing and transition economies studies; and (6) Asian and transcultural studies.



## For Prospective Students

In GSE, international graduate education has already been institutionalised through the EA Programme established in 2009.

This programme will provide the foundations for provision of international collaborative education (e.g. joint/double degree programs) in Tracks 1 to 5.

GSE plans to establish a new division for this international collaborative education within a few years, but for the time being, students who are interested in the aims and contents of the five tracks are encouraged to apply for the EA Programme.

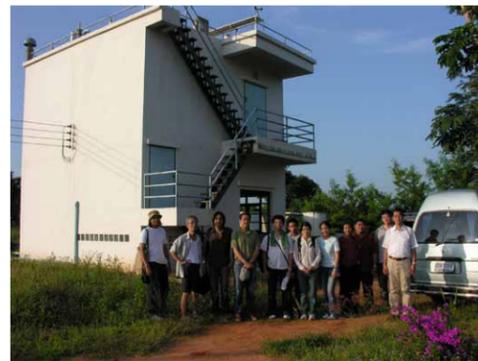


# Collaborative Observation and Education for Earth and Space Sciences in Thailand

Graduate School of Science (Data Analysis Center for Geomagnetism and Space Magnetism/ Integrated Earth Science Hub)  
Disaster Prevention Institute (in collaboration with Chulalongkorn Univ., BRRAA, KMITL, Univ. Tokyo, JAMSTEC, Chiba Univ., and many others)

## Objective and History

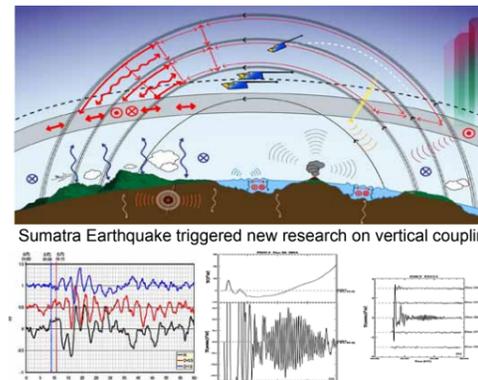
- ◆ This project aims at geophysical observation and education through the observation mainly at the Phimai Atmospheric Science Observatory. The main objective is to get the data of precise geomagnetic field variation, GPS observation, high resolution atmospheric pressure and precipitation etc.
- ◆ The observation in Phimai started in 2004 and a part of the activities was supported by the KAGI21 project. The observatory is maintained by the collaboration among several universities and institutions in Thailand and Japan.
- ◆ The Great Sumatra Earthquake occurred on December 26, 2004. The data obtained during and after the earthquake triggered some new research in upper atmospheric physics.
- ◆ The Phimai observatory has been used also for various research in atmospheric and solid Earth sciences and for education.



Phimai Atmospheric Science Observatory

## Observation and Some Results

- ◆ Unusual geomagnetic pulsations were observed at the time of the great earthquake off the Sumatra Island in 2004. The pulsations were observed at Phimai Observatory, Thailand. At the same time, long lasting oscillations with similar period (i.e., about 4 minutes) were observed in GPS TEC (Total Electron Content) observation. We concluded that these phenomena are caused by a vertical coupling between lower atmosphere and thermosphere/ionosphere through the acoustic gravity waves. This finding leads to a systematic research project with satellite and ground magnetic observations and micro-barometric observations. (e.g., Iyemori et al., 2005; Choosakul et al., 2009)
- ◆ We try to detect the geomagnetic secular variation with timescales of 100 – 1000 years from measurement at archeological remains. Those timescales are considered important for revealing the geodynamo effect that is generating the geomagnetic field in the outer core of the Earth. (Iyemori et al., 2011)



Geomagnetic and TEC pulsations just after the 2004 Sumatra Earthquake



Various meteorological and geodetic instruments set on the top of the Phimai obs.



A symposium held at Chulalongkorn University



Geomagnetic observation in the field



Khmer temples and other archaeological remains seem to keep the geomagnetic declination at the era.

# Faculty of Engineering Graduate School of Engineering

## Outline

The Faculty of Engineering is the largest faculty of Kyoto University. It is composed of six departments: Global Engineering, Architecture, Engineering Science, Electrical and Electronic Engineering, Informatics and Mathematical Science, and Industrial Chemistry. Collectively, these departments cover practically all fields of engineering. The faculty aims to cultivate specialists with the ability to grasp scientific concepts through their own perception and perspective, who will go on to be pioneers in new and emerging fields of technology, that impact the lives of people.

The Graduate School consists of 17 departments and 8 centers that cover a very broad range of research, from fundamental theoretical studies in mathematics, physics, chemistry and biology to the development of new technologies in harmony with the natural environment. The successful results yielded by the school's approach to research have been acknowledged internationally, and several of its researchers have received prestigious awards, including the Nobel Prize.

The school's facilities at Katsura Campus, opened in 2003 as the third campus of Kyoto University, provide training geared toward developing creative research and development skills. In addition to operating educational programs, the facilities at the new campus actively collaborate with the industrial sector, and aim to produce innovative, cutting-edge science and technology which will benefit society.

In 2008, two integrated master's-doctoral courses were launched: the Integrated Engineering Course is an interdisciplinary course with a focus on exploring newly combined fields of engineering, while the Advanced Engineering Course focuses on fundamental science. Both courses are geared to educate skilled professionals in new fields of engineering.



Katsura Campus

## Number of Students

As of Apr 1, 2014

Figures in parentheses are numbers of foreign students

### Faculty

Undergraduate departments		
Global Engineering	816	(54)
Architecture	350	(8)
Engineering Science	1059	(18)
Electrical and Electronic Engineering	619	(23)
Informatics and Mathematical Science	448	(12)
Industrial Chemistry	1078	(22)
<b>Total</b>	<b>4370</b>	<b>(137)</b>

### Graduate School

Departments	Master's Course	Doctorate Course
Civil and Earth Resources Engineering	152 (12)	70 (37)
Urban Management	128 (11)	60 (28)
Environmental Engineering	76 (2)	41 (24)
Architecture and Architectural Engineering	156 (9)	51 (13)
Mechanical Engineering and Science	119 (11)	32 (9)
Micro Engineering	55 (2)	20 (6)
Aeronautics and Astronautics	57 (1)	16 (3)
Nuclear Engineering	45 (0)	16 (5)
Materials Science and Engineering	83 (6)	36 (13)
Electrical Engineering	82 (3)	28 (9)
Electronic Science and Engineering	68 (4)	33 (7)
Material Chemistry	62 (1)	22 (3)
Energy and Hydrocarbon Chemistry	85 (6)	35 (10)
Molecular Engineering	67 (0)	20 (6)
Polymer Chemistry	103 (7)	32 (8)
Synthetic Chemistry and Biological Chemistry	73 (4)	42 (8)
Chemical Engineering	74 (4)	15 (2)
<b>Total</b>	<b>1485 (83)</b>	<b>569 (191)</b>



First graduates from Kyoto Imperial University (July, 1900)  
A document offer: Kyoto University Archives

## History

1897	6	Kyoto Imperial University established.
	9	Science and Engineering College established.
1914	7	Separated Science and Engineering College divided into Science College and Engineering College.
1919	2	Engineering College became Faculty of Engineering.
1947	9	Kyoto Imperial University changed its name to Kyoto University.
1953	4	Graduate School of Engineering established.

# International Program on Resilient Society Development under Changing Climate (2016-2020)

Project Director: Prof. Hiroyasu Ohtsu, Professor, Graduate School of Engineering, Kyoto University



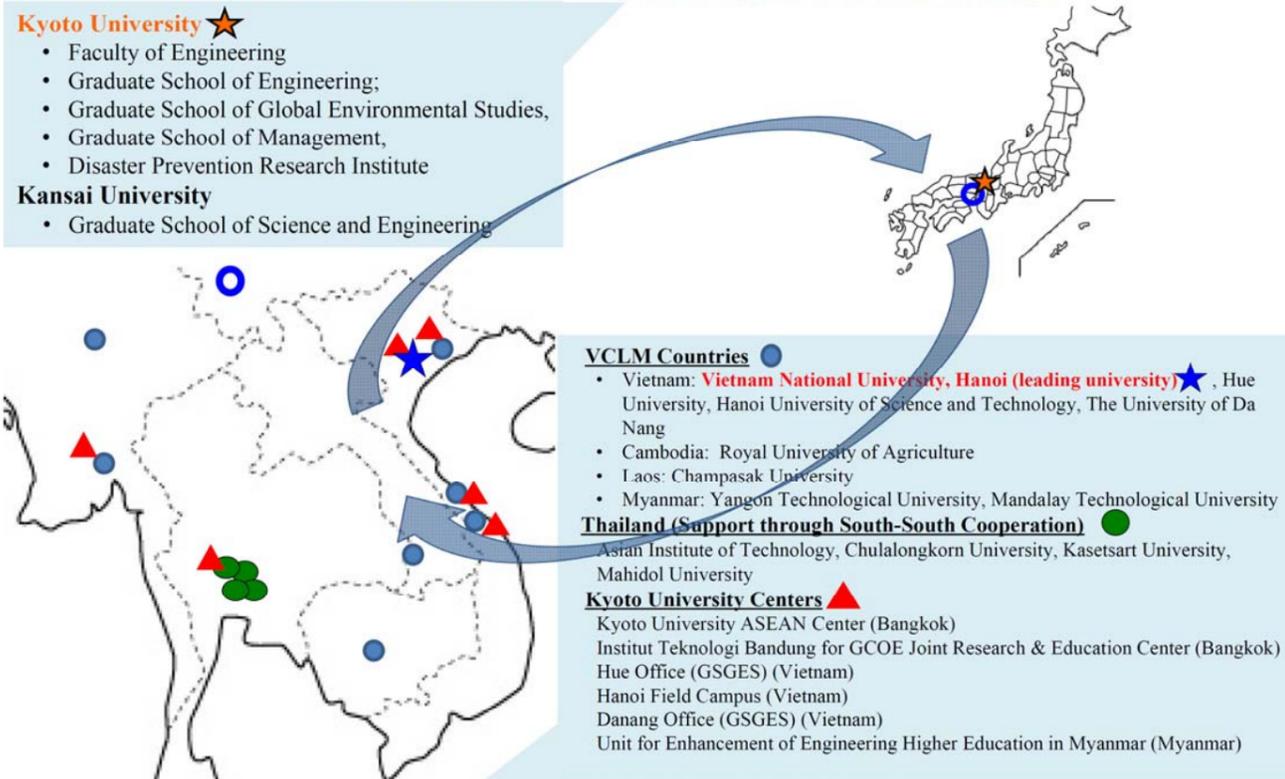
## Overview

With the increasing impact of natural disasters caused by climate change that is a real threat today than ever before, the impact of such disasters on not only Japan but also ASEAN countries will become abundantly clear over the next few years, and a concern has emerged that the social and economic development of various regions will be impacted tremendously. There is, therefore, an urgent need for universities in Japan and other ASEAN countries to understand the historical, social, and economic situations of each region and work together to train and nurture "infrastructure human resources" who can lead the development of societies resilient to climate change in order to counteract the effects of such disasters. Accordingly, this project aims to train "infrastructure human resources" in the social infrastructure and environmental fields through cooperation amongst Kyoto University, Kansai University, and collaborating universities in ASEAN countries by implementing exchange programs, which include programs ranging from short-term and medium-term exchange to long-term exchange for attaining academic degrees.

In order to ensure resilient social development adapted to climate change, the project aims to train international human resources who understand the historical, social, and economic conditions in each ASEAN country, collaborate with people in each ASEAN country to devise social infrastructure appropriate for their particular country/region, work hard, and take action to create actual social infrastructure in each region.

## Overseas Network

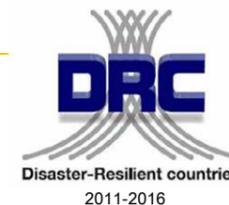
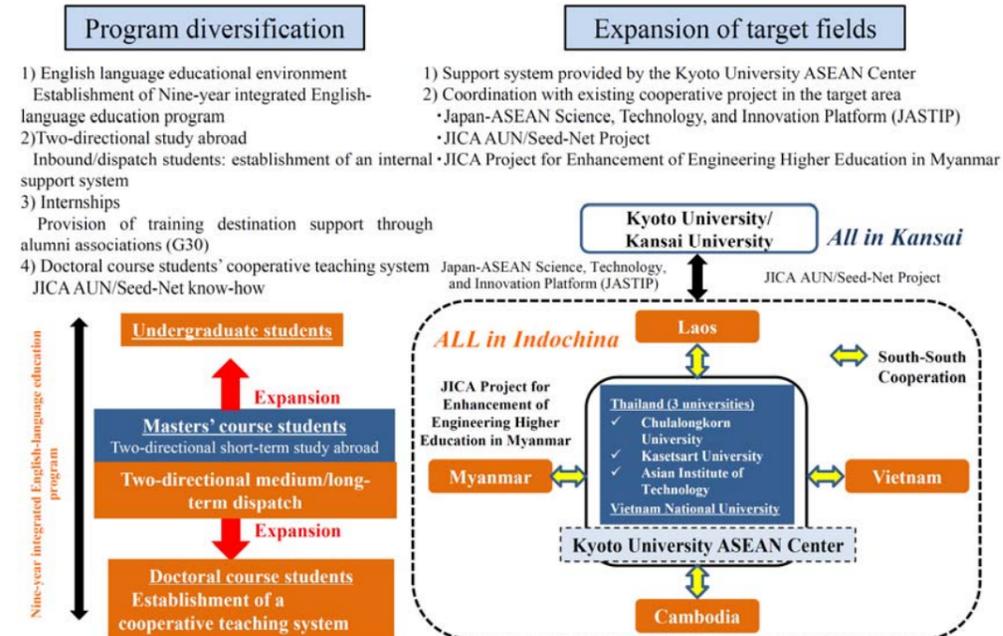
### Structure of the Alliance for Training International Infrastructure Human Resources to Lead Resilient Social Development Against Climate Change



# International Program on Resilient Society Development under Changing Climate (2016-2020)

Project Director: Prof. Hiroyasu Ohtsu, Professor, Graduate School of Engineering, Kyoto University

## Overview of the Project



Field Trip of MS1  
Kobe, Japan



Intensive Lecture of ES1  
Kyoto University



Field Trip of AES2  
Samutprakan  
Province, Thailand

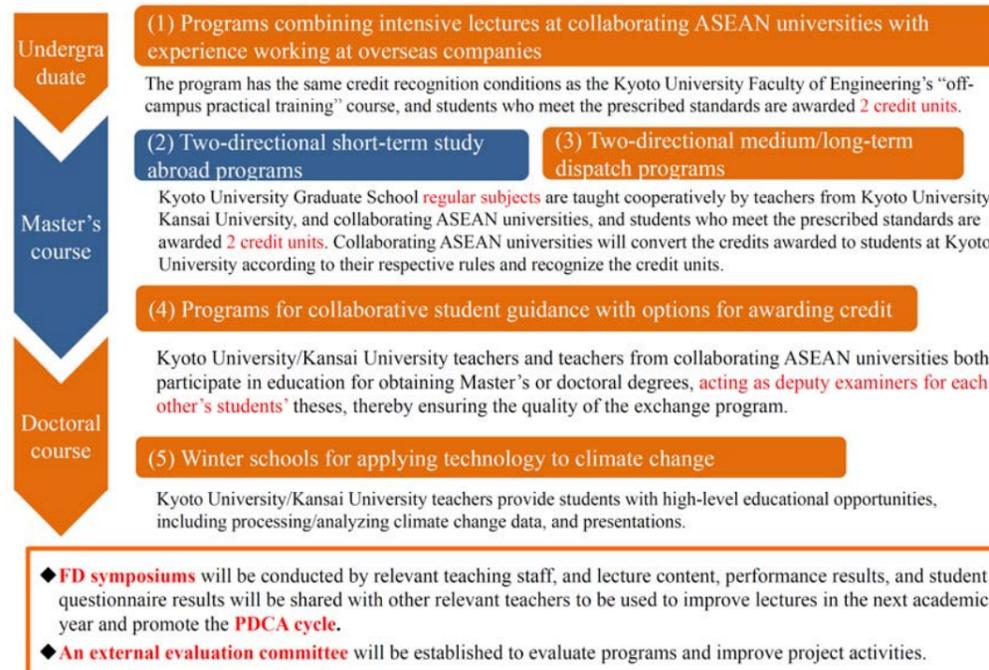


Group Work of AES1  
Kasetsart University



Faculty Development  
Symposium  
Bangkok Thailand

## Education Program



# JSPS Asian Core Program

"Research and Education Center for the Risk Based Asian Oriented Integrated Watershed Management"

Program coordinator: Yoshihisa SHIMIZU  
Affiliation: Research Center for Environmental Quality Management, Graduate School of Engineering

## Program Overview

**Asian Core Program** entitled "Research and Education Center for Risk Based Asian Oriented Integrated Watershed Management" is carried out between Japan and Malaysia from FY2011 to FY2015. The research topics deems to be of cutting-edge and high international importance striving for **"Asian wisdom" for integrated watershed management**.

This program is co-funded by Japan Society for the Promotion of Science and Ministry of Education Malaysia, and coordinated by Professor Yoshihisa SHIMIZU (Kyoto University) and Professor Nik Meriam NIK SULAIMAN (University of Malaya).

Throughout this program, a **world-class international research and education hub** is going to be created in Malaysia. It is expected to become a leading hub of Asian countries.



Fig.1 Program scope

Fig.2 Program organization

## Research and Education

The research activities are carried out under 4 research groups; **Hydrology, Water Quality, Environmental Risk** and **Governance** with mutual collaboration of Japanese and Malaysian researchers coordinated by group leaders. The research areas are **Selangor, Langat** and **Johor River basin** in Malaysia, and **Lake Biwa-Yodo River basin** in Japan.

The program also aims to foster environmental leaders in young generation. Long-term research stay in counterpart country, presentations in annual symposium and any other exchange projects are prioritized to young researchers and graduated students throughout this program.



Fig.3 Research area



Fig.4 Research & Education activities



Fig.5 Research group

## Research & Education Hub and KU-UM Newsletter

Kyoto University launched a satellite office, **Kyoto University – University of Malaya office (KU-UM Office)**, in January 2010. This office is actively functioned to manage ongoing programs as well as to store all the documents and e-files as repository. Thus, this office steps up to an representative international research and education hub.

This program publishes a periodical newsletter, **Kyoto University – University of Malaya Newsletter (KU-UM Newsletter)**, every 4 months to report ongoing programs. It is publicized through this program homepage.



Fig.6 KU-UM office

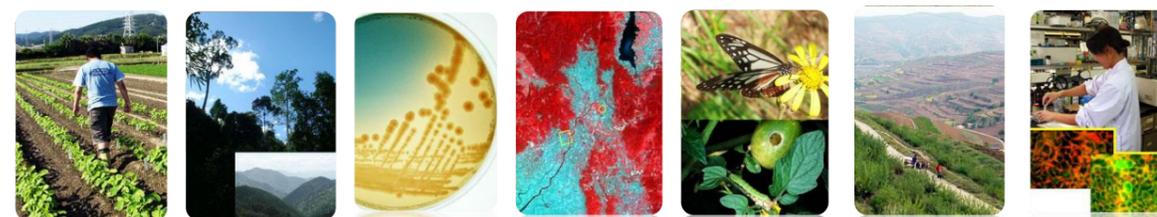


Fig.7 KU-UM Newsletter

# Faculty of Agriculture Graduate School of Agriculture

## ABOUT US

The Faculty/Graduate School of Agriculture, Kyoto University provides education and promotes research on a wide variety of subjects related to **"Life, Food and Environment"**. The education and research aims to improve the productivity of agriculture, forestry and fisheries, as well as to preserve the environment, in which such production activities are performed. The sciences covered range from a molecular to a global level, and deal with mechanisms of life, the balance of biological interactions in the environment, material cycling on the earth, and even human activities to sustain society. We believe that through a better understanding of life, the products of our studies will achieve development in new and excellent pharmaceuticals, pesticides, industrial materials, functional foods and energy resources. An overview of the broad nature of the education provided by this Faculty/Graduate School can be gained, in part, by browsing the series of Open Courseware that are accessible from the University website. (Prof. E. Nawata, Dean)



## History

- 1923: Faculty of Agriculture was established as the 7<sup>th</sup> faculty of Kyoto Imperial University. It consisted of Farming and Horticulture (Later changed to Agriculture) Forestry, Agricultural Chemistry, Biology of Agriculture and Forestry, Agriculture and Forestry Engineering, and Economics of Agriculture and Forestry.
- 1953: Graduate School of Agriculture established along with the establishment of Kyoto University Graduate Schools.
- 1981: 10 departments of the Faculty and 11 divisions of the Graduate School were set up and the Division of Tropical Agriculture established to extend the education and studies in Tropical Region.
- 2001: Current 7 divisions structure was established.

## Structure

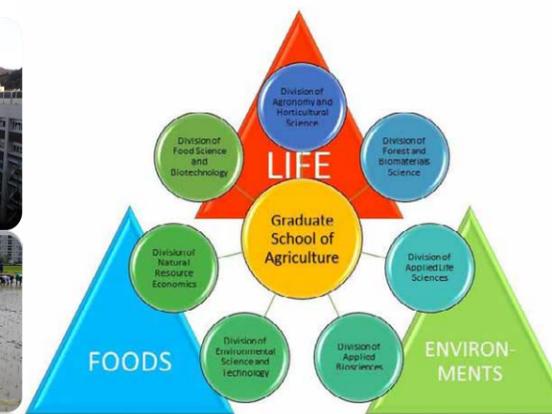
Graduate School of Agriculture consists of 7 divisions 2 farms and 93 laboratories with 200 teaching staff.

- | Divisions | Agronomy and Horticultural Science   |
|-----------|--------------------------------------|
|           | Forest and Biomaterials Science      |
|           | Applied Life Sciences                |
|           | Applied Biosciences                  |
|           | Environmental Science and Technology |
|           | Natural Resource Economics           |
|           | Food Science and Biotechnology.      |
| Farms     | Experimental Farm                    |
|           | Livestock Farm                       |

Our education and research are conducted with close collaboration with The Research Institute for Sustainable Humanosphere Field Science Education and Research Center.



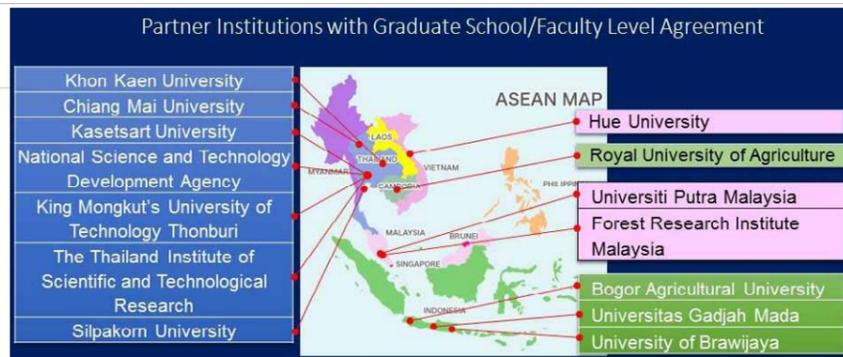
Field Station(FS) and Experimental Station(ES) are under Field Science Education and Research Center



# Network and Research Office of Graduate School/Faculty of Agriculture

## Partner Institutions

Faculty/Graduate School of Agriculture (GSA) collaborates with universities and institutions in ASEAN countries. Besides of University Level Agreement, we signed with 13 partner faculties, universities, and institutions in ASEAN countries for academic and students exchange (see right map). We are willing to increase the number of partners.



## Research Offices in ASEAN

GSA is running three field research offices based on agreements with partner institutions. Further offices are now under negotiation.

### Khon Kaen University Research Office of GSA, Kyoto University

Thailand

Khon Kaen Research Office of GSA was established in 1996, when a project named "Mapping Agricultural Productivity in Northeast Thailand" was being conducted with Khon Kaen University. The office was established collaboratively with Khon Kaen University and Center for Southeast Asian Studies, Kyoto University. In 2006, the office was renovated as a overseas research office of GSA. The office is now functioned as the base of field study projects and various educational programs, especially in agricultural field, of GSA, other graduate schools and faculties of Kyoto University, and other Japanese universities.



### Kinabalu Park: Japanese Research-Team Laboratory, Kinabalu Park Headquarters

Malaysia

Kinabalu Park Research Office was established in 1995 to facilitate and enhance the various studies on tropical rain forest of Mt. Kinabalu. From the foot to summit of Mt. Kinabalu, long-term monitoring plots were established and maintained for more than 20 years. The office is utilized by researchers and students of various countries and recognized as one of the renown field research station in tropics.



### Deramakot Forest Reserve: Japanese Research-Team Laboratory, Deramakot Forest Reserve

Malaysia

The office was established in 2003 to facilitate and enhance the studies on the sustainable management of tropical rain forest. The long-term effects of reduced impacts on biodiversity and sustainability of forestry are continuously studied by international teams by using this research office.



### New Offices

Several new offices are now in preparation. A office at Faculty of Forestry, Kasetsart University (FFKU) has been established to enhance collaborative studies with FFKU on tropical forest and forestry.



# Core Research Sites and International Educational Program of Graduate School/Faculty of Agriculture

## Core Research Sites

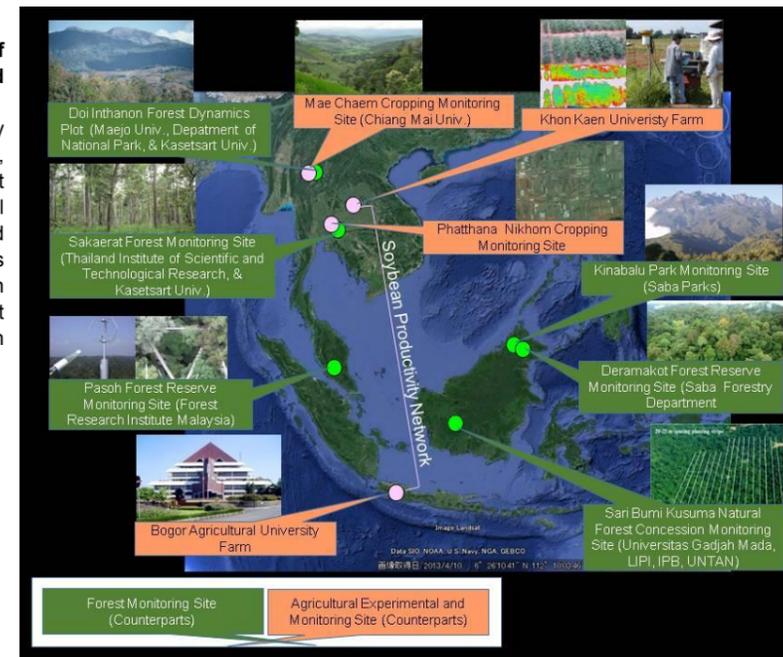
Graduate School/Faculty of Agriculture (GSA) continue various collaborative researches with ASEAN universities. Some of the project established core research sites for networked and/or long-term oriented researches in collaboration with ASEAN universities and institutions. Some examples are shown below.

### Evaluation of potential productivity of soybean in tropical environment and investigation of adaptive genotypes

This is a networked study with Khon Kaen University (Thailand), Bogor Agricultural University (Indonesia), and GSA. Project term 2013-2017. Divergent soybean genotypes from temperate and tropical regions are being tested for their growth and yield performances under "hot climate". The objectives are to quantify the potential productivity of soybean under high temperature environments and to find out genotypes superior in adaptation ability to high temperature environment under global warming.

### Long-term monitoring of Southeast Asian tropical forests and cropping systems

Southeast Asia is one of the hot-spots of biodiversity and GSA researchers continue the monitoring of various tropical forest from lowland tropical rainforests to tropical montane forests, from pristine forest to logged forest. The monitoring covers tree population dynamics, biodiversity, exploration of epiphytic plants, etc. The researchers are also focuses on biological productivity, climate change, and greenhouse gas emission. These research projects are carried out with counterpart universities and institutions. Our monitoring also covers the cropping systems in Thailand. These monitoring researches will clarify the impact of global warming and are expected to contribute to human adaptation to global warming.



## International Educational Program

### AUN-KU Student Mobility Program toward Human Security Development

The ASEAN University Network (AUN) – Kyoto University (KU) Student Mobility Program was selected as part of the "Re-Inventing Japan Project" in fiscal year 2012 by MEXT. KU and AUN collaborate through setting international academic exchange agreements and form a consortium. GSA is one of the main schools of this program and started double degree program with Universitas Gadjah Mada (Indonesia) and Kasetsart University (Thailand). GSA also accept single degree program students from AUN membership universities.

### G30/Special Course in Agricultural Science

GSA offers an international education program, "Special Course in Agricultural Science – For the Global Future of Life, Food and the Environment", since April 2010, under the umbrella program "K.U.PROFILE" (Kyoto University Program for Future International Leaders). This course provides master's and doctoral courses for international students and the curriculum is provided in English. Several scholarship opportunities are available in this course.



# Graduate School of Energy Science

-The new Interdisciplinary Field for Solution to Energy Problems

# Graduate School of Energy Science

## ABOUT

It is long since the energy and the global environment began the serious problem which the humankind should solve. The abnormal weather often causes damage in various places in the world in recent years. Many children say that they aim to solve the global environmental problem in the future. Everyone knows that CO2 emission must be decreased. However, the agreement on this issue between advanced nations and developing countries can hardly be obtained. Our former prime minister declared to decrease CO2 emission in Japan to 75%. But, he does not know how. It became more difficult after the earthquake disaster in 2011.

To solve such various problems of energy and environment, the Graduate School of Energy Science was founded in 1996. The Graduate School consists mainly of engineering fields, but the problems cannot be solved only by engineering. Therefore, it consists of wide-ranging academic areas not only of natural sciences such as science and agriculture, but also of social sciences such as economy and law. The Graduate School has been working on the creation of novel learning of the energy science, on the development of technology for energy and the environment, on the cultivation of excellent human resources having specialized wisdom in energy and environment, and on making a contribution to society.

## Organization

**Socio-Environmental Energy Science**  
Helps students develop problem-solving capabilities for broad energy issue

Seeking ideal energy and social systems in harmony with the natural environment

**Fundamental Energy Science**  
Focuses on basic science training (chemistry and physics) as related to energy problems

Fundamental Science for the Exploration of New Energy Sources

**Energy Conversion Science**  
Helps students obtain a thorough understanding of principles and applications of energy conversion systems suited to natural environment

Energy Conversion Systems and their Functional Design in the 21st Century

**Energy Science and Technology**  
Trains students in thermal science and processing technologies for highly-efficient energy utilization

To Establish Environmentally Friendly Process Technologies to Sustain the Development of Our Society

The Department of Socio-Environmental Energy Science aims to establish ideal energy systems harmonizing with natural and human environments to sustain the continuous development of human civilization. For this purpose, various energy problems are systematically analyzed from sociological, political, economical, biological and environmental perspectives.

Division	Groups	Focus
Social Science of Energy	<ul style="list-style-type: none"> <li>Engineering for Social Systems</li> <li>Energy Economics</li> <li>Energy Ecosystems</li> </ul>	Primary subjects of study include the technological and biological treatment of energy production, storage, distribution, utilization and its rejection. Concurrently, great stress is placed upon the economy, safety and environmental feasibility of available energy, targeting the ideal social system for energy utilization.
Socio-Environmental Energy Systems	<ul style="list-style-type: none"> <li>Energy and Information</li> <li>Energy and Environment</li> </ul>	The main focus is on the planning, design and evaluation of energy systems from, energy production to energy utilization, and safety countermeasures for environmental protection. The harmony of energy systems with society and the environment is seen as vital.
Societal Energy Science	<ul style="list-style-type: none"> <li>Energy Policy</li> <li>Societal Energy Education</li> <li>Energy and Communication</li> </ul>	The research topics focus on energy policy and education related to the international, societal and technological issues such as energy security and disaster prevention, and also on a system of human communication for safety culture related to energy supply and demand.

We offer education and conduct research on fundamental science, seeking for solutions to energy problems. The research fields covered by this department include physical chemistry, material chemistry, electrochemistry, solid state chemistry, biochemistry, quantum mechanics, electromagnetics, statistical mechanics, plasma physics and nuclear physics.

Division	Groups	Focus
Energy Reactions	<ul style="list-style-type: none"> <li>Energy Chemistry</li> <li>Quantum Energy Processes</li> <li>Functional and Solid State Chemistry</li> </ul>	This division focuses upon education and research on chemistry for elementary processes, chemical reactions, reaction processes, substances and materials as related to production, control and the conversion of various kinds of energy such as quantum, thermal, chemical and electrical energy.
Energy Physics	<ul style="list-style-type: none"> <li>Plasma and Fusion Science</li> <li>Electromagnetic Energy</li> <li>Plasma Physics</li> </ul>	This division conducts research and teaching on energy physics based on mechanics, electromagnetism, statistical physics, and material physics. We target a thorough understanding of various physical processes that appear in fundamental energy science. We also pursue the peaceful use of nuclear fusion energy.
Plasma Science	<ul style="list-style-type: none"> <li>Fusion Energy Control</li> <li>High-Temperature Plasma Physics</li> </ul>	Plasma physics and controlled nuclear fusion are the main research and educational subjects. In particular, nonlinear and synergetic effects concerning plasma transport and heating are investigated in complex toroidal systems such as stellarators/heliotrons. Current research includes experimental, theoretical, and computational studies on, 1) magnetic surface topologies, 2) the kinetic and magnetohydrodynamic properties of toroidal plasmas, 3) confinement and relaxation of energetic particles, and 4) neutral beam and electron/ion cyclotron heating.
Energy Materials Science	<ul style="list-style-type: none"> <li>Interfacial Energy Processes</li> <li>Energy Nano Engineering</li> <li>Biofunctional Chemistry</li> <li>Bioenergy</li> </ul>	Education and research activities are concerned with the chemical processes of materials and energy covering a wide field extending from quantum processes to molecular assemblies. This division aims to clarify the connection between microscopic and macroscopic aspects. Chemical principles and techniques enabling the effective utilization of energy resources are also actively pursued.
Nuclear Energy	<ul style="list-style-type: none"> <li>Fundamental Neutron Science</li> <li>Energy Transport</li> </ul>	To develop innovative high-performance nuclear systems for energy generation or neutron application, studies are focused on the scientific principle and neutronics design of nuclear systems, and on new principles and methods for energy transportation and storage.

In order to contribute to the development of a human society that coexists with the natural environment, and to establish efficient clean energy systems, we offer education and conduct research on the generation, conversion, control and utilization of various kinds of energy from the perspectives of science and engineering.

Division	Groups	Focus
Energy Conversion Systems	<ul style="list-style-type: none"> <li>Thermal Energy Conversion</li> <li>Conversion Systems</li> </ul>	With the objective of unifying fundamental theories on energy conversion and transportation, functional design and constitutive elements of systems, and investigating safety and highly-efficient energy conversion systems in harmony with the environment, the foundation and methodology of the related evaluation, design and control are being studied.
Design for Energy Conversion Functions	<ul style="list-style-type: none"> <li>Materials Design for Energy Systems</li> <li>Design for Functional Systems</li> </ul>	In order to convert, transport and store energy with high efficiency, areas of study include the functions to be embodied in a variety of machines and their composed systems, the principles for the diversification of energy conversion, constitutive materials for hardware systems, the design of associated machineries and software, and the foundation and application of their safety and reliability.
Functional Energy Conversion	<ul style="list-style-type: none"> <li>Advanced Energy Conversion</li> <li>Highly Qualified Energy Conversion</li> <li>Functional Energy Conversion Materials</li> </ul>	In order to investigate highly-efficient safety energy conversion processes in harmony with the environment and to build systems, areas of study include the establishment of theories, application/evaluation and functional conversion systems from the manifold perspectives of fusion science and engineering, optical science, thermochemistry, advanced atomic energy, energy materials science and engineering, etc.

We offer education and research opportunities for the development of more efficient utilization of direct and indirect energy supplies based on disciplines such as resources, metallurgical, mechanical and electrical engineering.

Division	Groups	Focus
Materials Science & Engineering for Energy Systems	<ul style="list-style-type: none"> <li>Device Physics</li> <li>Process and Energy</li> <li>Materials Process Science</li> <li>Thermochemistry</li> </ul>	Fundamentals and applications of thermal science upon advanced energy device, advanced energy systems and superconducting apparatus.
Resources and Energy	<ul style="list-style-type: none"> <li>Resources and Energy Systems</li> <li>Advanced Processing of Resources and Energy</li> <li>Mineral Processing</li> </ul>	Education and research on supply systems and advanced processing of energy resources and materials, and related space technologies.
High Quality Energy	<ul style="list-style-type: none"> <li>Quantum Radiation Energy Science</li> <li>The Physics of Energy Materials</li> <li>Photon Energy Science</li> </ul>	Education and research on the generation and application of high-quality quantum-radiation energy materials, R&D for advanced energy systems and advanced photon energy with lasers.

## Recruiting

Pamphlets for introducing the graduate school are both in Japanese and English. By using them, public relations has been made through the homepage and a few of meetings to explain our graduate school and individual department have been held for stimulating the application. Also at the meeting, the selection methods and examination schedule of the concerned year are announced.

Applicants must obtain a hardcopy of the application guide and forms at the office of the Graduate School of Energy Science and read carefully before making an application. Before submitting their applications, applicants to the doctoral program must obtain the informal consent of their desired supervisor.

Master Course	2013	2014	2015	Doctor Course	2013	2014	2015
Capacity	130	130	130	Capacity	35	35	35
Applicants	287	251	308	Applicants	26	19	28
Successful Applicants	147	182	152	Successful Applicants	23	16	28
Entry	139	135	132	Entry	23	16	26

## Admission and Entrance Examination

### Master's Program

Applicants for the Master's Program must satisfy one of the following qualifications:

- Graduated from a university.
- Possess a Bachelor's degree obtained pursuant to Paragraph 4 of Article 104 of the School Education Law.
- Completed 16 years of education in another country.
- Completed 16 years of education in countries other than Japan by completing a correspondence course conducted by a school in the said country while residing in Japan.
- Completed a foreign university curriculum (only if completion of the curriculum is treated as completion of 16 years of education in said foreign country) in Japan at an educational facility accredited as having an approved curriculum under the educational system of said country and is designated as such by the Minister of Education, Culture, Sports, Science and Technology.
- Completed an advanced professional course at a higher vocational school on or after the date designated by the Minister of Education, Culture, Sports, Science and Technology.
- Designated by the Minister of Education, Culture, Sports, Science and Technology (Ministry of Education Notification No. 5 in 1953).
- Recognized by the University as having acquired sufficient credits with an excellent academic record while being enrolled for at least three years at a university (including cases corresponding thereto as designated by the Minister of Education, Culture, Sports, Science and Technology pursuant to Paragraph 2, Article 102 of the School Education Law).
- Recognized by the University as having a scholastic ability on par or exceeding that of a university graduate as a result of an individual screening of qualifications and at least 22 years of age.

The Number of Students to be admitted in Academic Year 2016

Department	Master's Program	Doctoral Program
Department of Socio-Environmental Energy Science	29	12
Department of Fundamental Energy Science	42	12
Department of Energy Conversion Science	25	4
Department of Energy Science and Technology	34	7
<b>Total</b>	<b>130</b>	<b>35</b>

Overseas students may elect to apply under a category set aside specifically for international students.

### Doctoral Program

Applicants for the Doctoral Program must satisfy one of the following qualifications:

- Possession of a Master's Degree, Professional Master's Degree or Juris Doctor Degree.
- Completion of a program abroad equivalent to the Master's Program or the professional degree program of Kyoto University Graduate School.
- Completion of the a program equivalent to a Master's Program or professional degree program of Kyoto University Graduate School by completing a correspondence course conducted by a graduate school of a university abroad while residing in Japan.
- Completion of a foreign graduate school program (only if the program is equivalent to a Master's Program or professional degree program of Kyoto University Graduate School) in Japan at an educational facility that has been accredited as having an approved program under the educational system of said country and is so designated by the Minister of Education, Culture, Sports, Science and Technology.
- Completion of a curriculum at the United Nations University (under the provisions of Paragraph 2 of Article 1 of the Act on Special Measures Incidental to Enforcement of the Agreement between the United Nations and Japan regarding the Headquarters of the United Nations University, Act No. 72 of 1976), and receipt of a degree equivalent to a Master's Degree.
- Passing of a Qualifying Examination or equivalent assessment at an institution in another country, and recognition by Kyoto University as having academic ability on a par with or higher than that of a person with a master's degree.
- Designation by the Minister of Education, Culture, Sports, Science and Technology.
- Recognition by the Graduate School of Energy Science of Kyoto University as having a scholastic ability on a par with or higher than that of a person eligible under Paragraph 1 as a result of an individual screening of qualifications, where the applicant is aged 24 or over.

## Curriculum

For the Master's Program	For the Doctoral Program	For the Master's Program	For the Doctoral Program
<ul style="list-style-type: none"> <li>Special Subject on Socio-Environmental Energy Science 1, 2, 3, 4</li> <li>Socio-Environmental Energy Science I, II</li> <li>Energy, Society and Engineering</li> <li>Energy Economics</li> <li>Energy Systems Analysis and Design</li> <li>Energy Ecosystems</li> <li>Human Interface</li> <li>System Safety</li> <li>Atmospheric Environmental Science</li> <li>Energy Societal Education</li> <li>Energy Policy</li> <li>Energy Communication</li> </ul>	<ul style="list-style-type: none"> <li>International Economics &amp; Energy Politics</li> <li>Environmental Energy</li> <li>Field Research Project on Socio-Environmental Energy Science</li> <li>Special Fundamental Subject 1, 2</li> <li>Industrial Ethics</li> <li>Special Seminar on Interdisciplinary Energy Science</li> <li>Future Energy: Hydrogen Economy</li> <li>Energy Systems and Sustainable Development</li> </ul>	<ul style="list-style-type: none"> <li>Social Engineering of Energy, Adv.</li> <li>Energy Economics, Adv.</li> <li>Energy Ecosystems, Adv.</li> <li>Energy and Information, Adv.</li> <li>International Energy, Adv.</li> <li>Advanced Seminar on Socio-Environmental Energy Science (in English)</li> <li>Zero-emission Social System</li> <li>Field Research Project on Energy Science</li> </ul>	<ul style="list-style-type: none"> <li>Advanced Study on Fundamental Energy Science</li> <li>Molecular Science of Fluids</li> <li>Biofunctional Chemistry</li> <li>Structural Energy Bioscience</li> <li>Fusion Plasma Engineering</li> <li>High-Temperature Plasma Physics</li> <li>Plasma Heating</li> <li>Plasma Diagnostic</li> <li>Energy Transport</li> <li>Neutron Mediated Systems</li> <li>Introduction to Experiments Using Nuclear Reactors</li> <li>Advanced Energy Creation, I</li> <li>Physics of Superconductivity</li> <li>Field Research Project on Fundamental Energy Science</li> <li>Functional Materials Computer Programming</li> <li>Plasma Physical Kinetics</li> <li>Nanotechnology for Energy</li> <li>Materials Science for Energy</li> <li>Processes for Photonics and Electronics</li> </ul>
<ul style="list-style-type: none"> <li>Advanced Study on Energy Conversion Science 1, 2, 3, 4</li> <li>Energy Conversion Fundamentals</li> <li>Rate Processes</li> <li>Heat Engine Systems</li> <li>Thermal Energy Systems Design</li> <li>Combustion Science and Engineering</li> <li>Pollutant Treatment in Energy Conversion Systems</li> <li>Fracture Mechanics for Energy Systems</li> <li>Science for System Integrity</li> <li>Theory of Plasticity</li> <li>Estimation Mechanics of Materials</li> <li>Continuum Thermodynamics</li> <li>Fundamentals of Fusion Energy System</li> <li>Advanced Energy System Technology</li> <li>Particle Beam Energy Conversion</li> <li>Advanced Electromagnetic Energy</li> <li>Functional Energy Conversion</li> </ul>	<ul style="list-style-type: none"> <li>Materials for Energy Conversion</li> <li>Engine Combustion Analysis</li> <li>Nuclear Power Plant Engineering</li> <li>Field Research Project on Energy Conversion Science</li> <li>Special Fundamental Subject 1, 2</li> <li>Industrial Ethics</li> <li>Special Seminar on Interdisciplinary Energy Science</li> <li>Exploratory Project for Promotion of Advanced Energy Conversion Science</li> <li>Fusion Energy Science and Technology</li> <li>Energy Conversion System Design and Functional Design</li> <li>Field Research Project on Energy Science</li> </ul>	<ul style="list-style-type: none"> <li>Advanced Study on Energy Science and Technology 1, 2, 3, 4</li> <li>Introduction to Energy Science and Technology</li> <li>Advanced Energy Science and Technology</li> <li>Thin Film Nanodevices</li> <li>Effective Utilization Engineering in Electrical Energy System</li> <li>Materials Processing</li> <li>Functional Materials Processing</li> <li>Thermochemistry</li> <li>Resource and Energy System</li> <li>Ocean Resources and Energy Technology</li> <li>Numerical Approach to Working Processes</li> <li>Computational Physics</li> <li>Advanced Physical Chemistry</li> </ul>	<ul style="list-style-type: none"> <li>Functional and Solid-State Chemistry, Adv.</li> <li>Physical Chemistry for Energy Science, Adv.</li> <li>Plasma Simulation Methodology I, II (in English)</li> <li>Topics in Plasma Dynamics, Adv.</li> <li>Special Topics in Advanced Energy Creation I, II</li> <li>Present and Future Trends of Fundamental Energy Science, Adv. (in English)</li> <li>Special Topics in Advanced Energy Science I, II</li> <li>Field Research Project on Energy Science</li> </ul>
Department of Socio-Environmental Energy Science		Department of Energy Conversion Science	
Department of Energy Science and Technology		Department of Energy Science and Technology	

# Graduate School of Energy Science

# Graduate School of Energy Science

## Requirement for Completion

### Requirements for the Master's Program

A Master's degree candidate is required to take at least 30 credits from the following listed subjects, to submit a master thesis guided by his/her supervisor(s), and to pass thesis examinations. No credit is offered for a thesis.

Group A Subjects: Required subjects for the home department and thesis.

Group B Subjects: Elective subjects offered by the home department.

Group C Subjects: Elective subjects offered by the three departments other than the home department.

Group D Subjects: Elective subjects offered by other graduate schools.

List of credit requirements and amounts:

Department	A	B [1]	B [2]	C	D
Department of Socio-Environmental Energy Science	8	≥ 14* **		≥ 8*	
	A	B	C	D	
Department of Fundamental Energy Science	≥ 12*	≥ 10, ≤ 18*		≤ 10*	≤ 8*
Department of Energy Conversion Science	≥ 6	≥ 10, ≤ 22*		≥ 2, ≤ 10*	≤ 6*
Department of Energy Science and Technology	≥ 6	≥ 10		≤ 8*	≤ 6*

\* Credits taken over these maximums will not be counted for the required 30 credits

\*\* Mandatory 4 credits from Required Subjects and minimum 10 credits from Elective Required Subjects.

### Requirements for the Doctoral Program

A Doctoral Degree candidate is required to take at least 4 credits from the subjects offered by the Graduate School, to submit a doctoral thesis guided by his/her supervisor(s), and to pass thesis examinations.

## Diploma Policy

### Master's (Energy Science)

Requirements for conferment of a Master's Degree in Energy Science are that students must be enrolled for a set period, take subjects stipulated in the graduate school curriculum handbook, which have been determined based on the curriculum policy of the Graduate School of Energy Science, earn exactly or more than the standard number of credits (30 credits) and, after receiving necessary research guidance, pass the master thesis screening and examinations.

Master thesis screening and examinations will focus on whether the thesis demonstrates research findings that are academically or practically beneficial to energy science, whether the applicant for master's degree possesses the ability to propel research, the ability to give logical accounts of research findings, a wide spectrum of specialized knowledge relating to his/her research field, ethics in academic studies etc.

Those that have made extraordinary progress in academic/research may shorten their enrollment period and complete their master's program early.

### Doctoral (Energy Science)

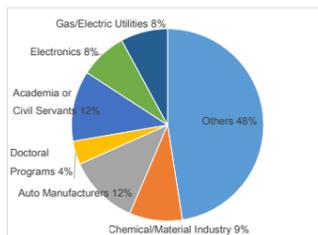
Requirements for conferment of a Doctoral Degree in Energy Science are that students must be enrolled for a set period, take subjects stipulated in the graduate school curriculum handbook, which have been determined based on the curriculum policy of the Graduate School of Energy Science, earn exactly or more than the standard number of credits (4 credits) and, after receiving necessary research guidance, pass the doctoral thesis screening as well as the examinations.

Doctoral thesis screening and examinations will be based on whether the thesis demonstrates research findings that are significantly beneficial, academically or practically, to energy science, whether doctoral degree applicant possesses the ability to plan and propel research and to give logical accounts of research findings, possesses a wide spectrum of sophisticated specialized knowledge relating to his/her research field, high ethics in academic studies etc.

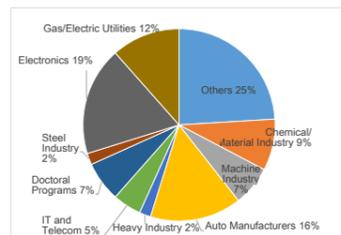
Those that have made extraordinary academic/research progress may shorten their enrollment period and complete their doctoral program early.

## Career Path

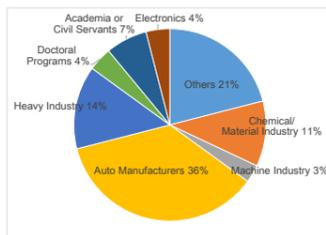
Academic Year 2014



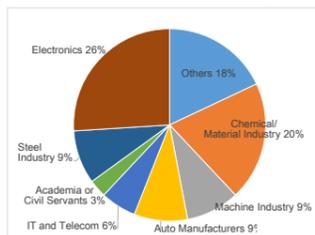
Department of Socio-Environmental Energy Science



Department of Fundamental Energy Science



Department of Energy Conversion Science



Department of Energy Science and Technology

## INTERNATIONAL EXCHANGE AFFAIRS

### 1. International Collaborations

The Graduate School of Energy Science (GSES) has established international exchange agreements with top level universities and institutes to promote mutual cooperation on education and scientific research. Under the agreements, the following general forms of cooperation will be pursued:

- (1) Joint research activities
- (2) Invitations to academics and researchers for lectures and seminars, and participation in conferences, colloquia and symposia
- (3) Exchange of scientific material and information
- (4) Exchange of faculty members and students for study and research

Currently, agreements with over 20 counterparts have been concluded, in cooperation with other schools and institutes of Kyoto University.

### 2. Promoting Student Mobility

Since its establishment, the GSES has received students from outside of Japan, and has also promoted short-term study abroad for our own students. The GSES has started a student mobility program with ASEAN University Network (AUN) member universities in cooperation with other graduate schools of Kyoto University.



AUN-KU Winter School 2015



Field trip to a mega solar power plant (Winter Seminar Program 2016)

The summer/winter school programs have been held since 2013 in Thailand, Indonesia and Japan to create opportunities for the undergraduate students from AUN member universities and Kyoto to study about energy in both host and home universities. Furthermore, a double master's degree program with some AUN universities has been initiated.

### 3. Exchange of Researchers

GSES has invited visiting professors from abroad as teaching staff. They are selected from highly active researchers in various academic fields, who may collaborate with our faculty and give students an opportunity to learn specialized subjects in English.

Individual departments and chairs have received researchers from various countries such as India, Indonesia, Thailand, China, Korea, Canada, USA, Australia, Austria, France, and others. Annually, around 100 researchers are dispatched to universities and research institutions abroad, contributing greatly to development of the international academic network on energy science. In addition, members of the GSES have organized numerous international conferences.

In the academic year 2014, the school organized or co-organized four international conferences in Japan, France, Indonesia and Thailand.

	MASTER'S	DOCTORAL
Degree conferred	Master's (Master of Energy Sci.)	Doctoral (Dr. of Energy Sci.)
Course duration	Two years, full-time	Three years, full-time
Required credits	Minimum of 45 credits	Minimum of 4 credits
Thesis & defence	Master's thesis, viva-voce	Doctoral thesis, viva-voce
Enrolment capacity	10 students per annum	10 students per annum
Enrolment	October	April and October
Application deadlines	January-February	June-July (April intake) January-February (October intake)

## International Energy Science Course ( IESC )

Energy is the challenge of our age, fundamentally involved in critical human survival issues of local and global concern such as climate change, economic growth, national and regional security. Individuals who have acquired systematic scientific knowledge in the relevant fields and broad and deep insight into underlying component technologies are therefore sought after across the world. To respond to this need, three departments of Kyoto University's GSES run postgraduate degree programs on energy in English-the "International Energy Science Course" (IESC). For the IESC, good command of academic English for course work and research is essential, while Japanese proficiency is not.

The two-year Master's program is a combination of coursework and research. Students are taught a wide spectrum of subjects – from the basics to cutting-edge research on production, storage, transportation, and consumption of energy. At the same time, students conduct research on their own topic, chosen from a wide range of research areas offered by the school. The program aims to teach students method for research and development of energy technology in support of a sustainable society.

Students are admitted based on application documents and an interview with staff of the GSES. The IESC Master's course commences in October each year. (Enrolment timing and conditions are subject to change. Please download the latest enrolment guide from our website.) The research group or laboratory to which students will be assigned for their research is determined with consideration to their preferences and notified at the announcement of admissions results.

The IESC doctoral program provides Master's graduates with the opportunity to further their study toward a doctoral degree by conducting research of the highest standards. The medium of instruction is English and the standard course duration is three years full time. Prior contact to a perspective supervisor to discuss a research plan is essential.

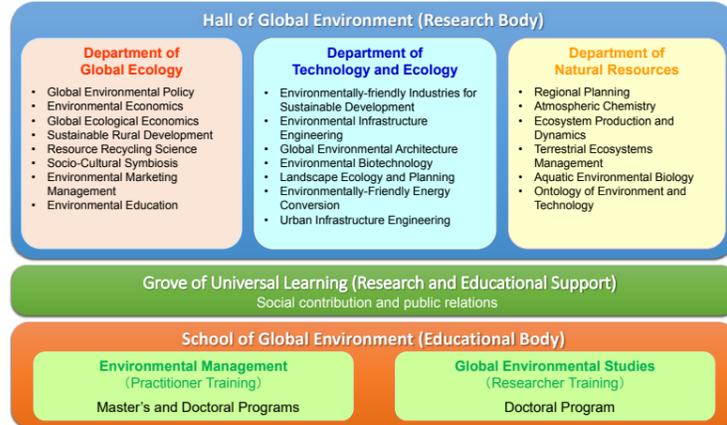
The IESC is offered by the departments of Socio-Environmental Energy Science, Fundamental Energy Science and Energy Conversion Science. For further information on the course, please see the website. <http://www.energy.kyoto-u.ac.jp/IESC/>

# Graduate School of Global Environmental Studies

## About us

The Graduate School of Global Environmental Studies (GSGES) was established in 2002 to address global environmental sustainability as a new field of academic study, bringing together ethics, science and technology, and humanities and social sciences. Through our educational and research programs we strive to foster new generation of professional practitioners. GSGES collaborates with many other graduate schools, institutes and research centers of Kyoto University to conduct interdisciplinary study and education that link other academic fields with global environmental studies. The educational programs emphasize formal instruction as well as collaboration with domestic and international NPOs and NGOs to give students opportunities for internship study and field experience in various sectors.

## Organization



Diverse Student Body

Consisting of students with an equal number of men and women, and a large percentage of international students from every continent, GSGES provides all compulsory and more than 70% of elective courses in English.



Field Training

One-week field exercise in northern Kyoto provides students from various background with opportunities of learning basic skills of environmental research in soil science, forest ecology, coastal and marine biology, and rural community.



Internships

An internship of 3 to 5 months is required for master's and Ph.D students. Experience in project-based learning enables students to acquire competence in addressing global environmental issues with professional views and skills.

## Collaboration with ASEAN countries

GSGES extends broad collaboration with partner universities, academic institutions, governmental and non-governmental organizations in ASEAN states, in conducting cooperative research projects, student exchange and internships, and outreach activities with local communities. We developed schemes for collaborative research and education including joint research on environment, disaster management and livelihood improvement, cross-border study tours in Indochina region, and international graduate curriculum with joint degree opportunities. Cooperation with local governments and communities have been also conducted.

### <Institutions with MOU and Internship Agreement>

#### Thailand

Mahidol University  
Kasetsart University  
Chulalongkorn University  
Khon Kaen University  
Asian Institute of Technology  
UNESCO Bangkok  
UN/ISDR Bangkok  
UNEP/ROAP  
Eco-Community Vigor Foundation

#### Vietnam

Vietnamese Academy of Science and Technology  
Hanoi University of Science and Technology  
Hue University of Agriculture and Forestry  
Hue University of Science  
The University of Danang  
Danang University of Science and Technology  
Institute for Social and Environmental Transition  
SEEDS Asia Danang Office  
UNESCO Hanoi  
Center d'Etude et de Cooperation Internationale

#### Malaysia

Universiti Teknologi Malaysia  
Universiti Malaysia Sabah  
Universiti Kebangsaan Malaysia  
Malay Agricultural Settlement  
MERCY Malaysia

#### Indonesia

Bogor Agricultural University  
UNESCO Jakarta  
ASEAN Secretariat

#### Philippines

Philippine Society of Youth Science Clubs  
Alternate Forum for Research in Mindanao

#### Laos

Champasack University  
Land Development Department

#### Cambodia

Royal University of Agriculture  
GERES Cambodia

#### Singapore

National Parks Board



Joint seminars and workshops



Water sampling in Hanoi



Joint field research in Laos



Community development project in Central Vietnam

# Graduate School of Global Environmental Studies

## Hanoi Office

The Kyoto University-Hanoi University of Science and Technology Research and Education Program on Environment Studies was established in December 2008. The program has an office and a laboratory for various environmental research topics, and received students from Kyoto University through the internship program. It is currently conducting research from such various standpoints as aquatic environment, urban sanitation, waste management, material cycle, and health risk management.

### Educational activities for KU

Long-term internship in Hanoi: 19 students (FY2008-FY2013)  
Degree research in Hanoi: 3 Ph.D, 12 Master and 6 Bachelor (FY2008-FY2016)

### Educational activities for HUST

19 short-term education certificate given to HUST's students and young staff (FY2008-2016)  
8 Ph.D and 1 Master given by KU to HUST graduates

### Research projects

- Water and Material flow
- Septic tank management
- Microbial health risk
- Anaerobic digestion of organic wastes
- 19 seeds research projects funded by GSGES (FY2013-16)

### Joint research outcome

29 peer-reviewed papers, 36 int'l conference papers, 7 awards (FY2008-2016)



Laboratory of Hanoi Office



HUST's students listening to a lecture

## Central Vietnam Offices

Since 2006 Graduate School of Global Environmental Studies have conducted intensive field-based researches and practical projects in the Central Vietnam. Two activity bases were established in Hue and Danang

### Hue

Established in 2006, the Kyoto University Office in Hue located at Hue University of Agriculture and Forestry facilitates cooperative research projects on various topics including aquatic environment, sanitation, architecture, disaster risk reduction, and environmental education. The office also assists student exchange and internship programs, by which more than 170 students from both universities visited each other since 2006. Outreach activities with local communities including JICA Partnership Programs are also supported by the office.

### Educational activities

Long-term internship in Hue: 23 students (FY2004-FY2013)  
Degree research in Hue: 4 Ph.D and 21 Master (FY2004-FY2013)  
International Exchange Course: "Livelihood, the Environment, and Peace- Learning from Vietnam-" (FY2006-)

### Research projects

- Community resilience against gradual hazards on vulnerable society in Indochina region (FY2008-FY2011)
- Transition of livelihood and social vulnerability under urban-rural development linkage (FY2013-FY2015)

### Outreach activities

- JICA Partnership Programs
- Enhancing community resilience and livelihood security to cope with natural disasters in central Vietnam (2006-2009)
- Integrated approaches to the vulnerable to cope with natural disasters in central Vietnam (2010-013)



Meeting at Hue Office

### Danang

Danang Office was established in 2009 in the Faculty of Environment, Danang University of Science Technology, and supported variety of environmental researches and educational activities on disaster risk management, water and wastewater treatment. They also support outreach activities with local communities on environmental education.

### Educational activities

Long-term internship in Danang: 7 students (FY2004-FY2013)  
Degree research in Danang: 4 Master

### Research projects

- Development and Evaluation of Water Reuse Technologies for the Establishment of 21<sup>st</sup> Century Type Water Cycle System (FY2010-)
- Evaluating Impacts and Resilience of Dam-Induced Resettlement of Ethnic Minority Villagers (FY2011-2012), etc.



GSGES Office in Danang University of Technology

## Partnership Office at Mahidol Univ.

The Kyoto University - Mahidol University Research and Education Program for Environment Studies was established in December 2015. Mahidol University is one of the top universities in Thailand, and is constructed of 17 faculties, 6 colleges, 8 research institutes and 7 centers. Bangkok is one of the best place to learn typical urban and sub-urban environmental issues in Asian developing countries such as water pollution, air pollution, waste management and so on.

Environmental Innovator Program – Cultivating Environmental Leaders across ASEAN region aims a fostering environmental and social innovator in ASEAN region, providing multi-disciplinary course work in environmental management, internship, thesis research.

This program offers two Master's Degrees from Mahidol University and Kyoto University, respectively. Mahidol University confers a Master of Engineering (Environmental and Water Resources Engineering). Kyoto University confers a Master of Global Environmental Studies.



Partnership office at Mahidol Univ.



Salaya Campus at Mahidol Univ.

# JSPS Core-to-Core Program "Construction of global environmental study basis through practical approaches based on the Asia Platform"

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## Outline

To find out the solutions of Global Environmental Issues, multidisciplinary studies should be not only enhanced but also researchers across countries should collaborate each other. GSGES had proceeded JSPS Core-to-Core Project named "Formulation of the cooperation hub for global environmental studies in Indochina region" (FY2013-2015) and established close networks between GSGES and partnership Universities especially in Indochina regions. Then, GSGES launched new JSPS Core-to-Core Project named "Construction of global environmental study basis through practical approaches based on the Asia Platform" in FY2016 which is, as a second step of former Project, bringing forward new schemes (Fig.) and is closely connected with EIP activities.

## Partnership Universities

- ◆ Hanoi University of Science and Technology
- ◆ The University of Danang
- ◆ Hue University
- ◆ Mahidol University
- ◆ Bogor Agriculture University
- ◆ University of Malaya
- ◆ University of the Philippines
- ◆ Royal University of Agriculture
- ◆ Champasack University

- Bases of the achievements of GSGES in educational and research collaboration in Indochina regions
- High evaluation by universities outside Indochina region and requirements of further contributions

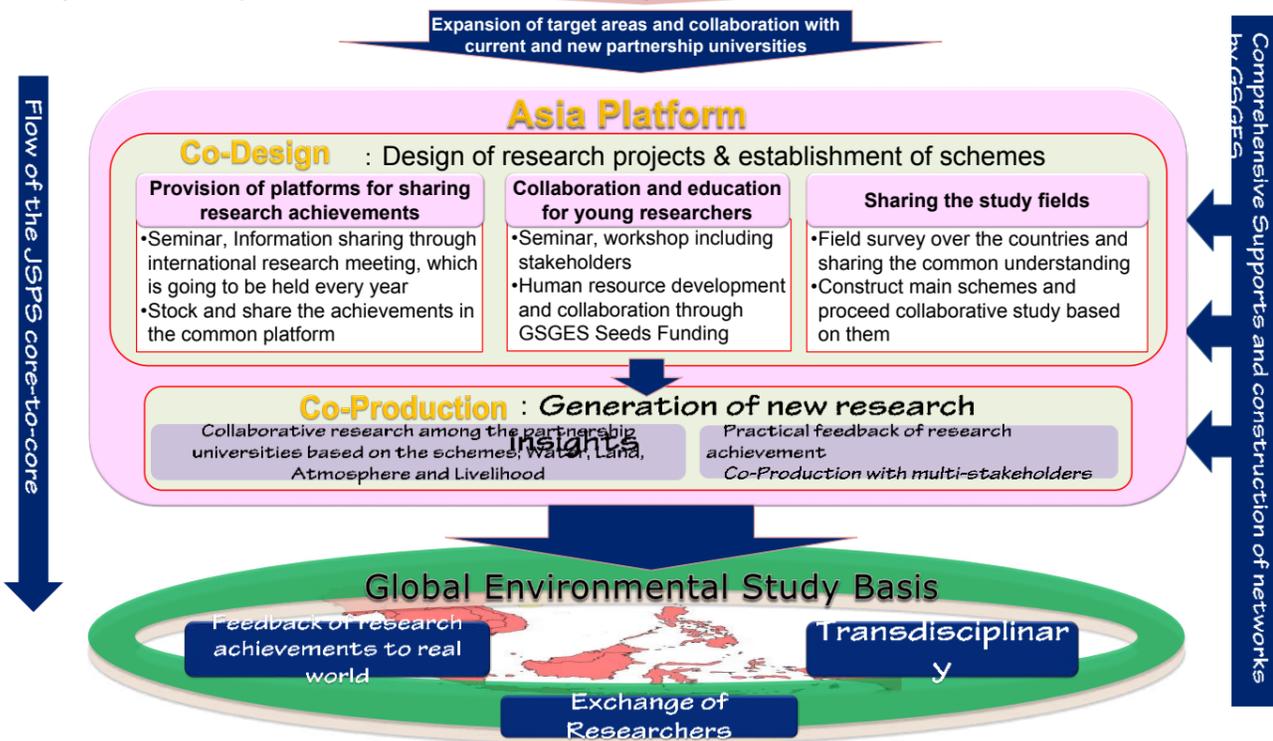


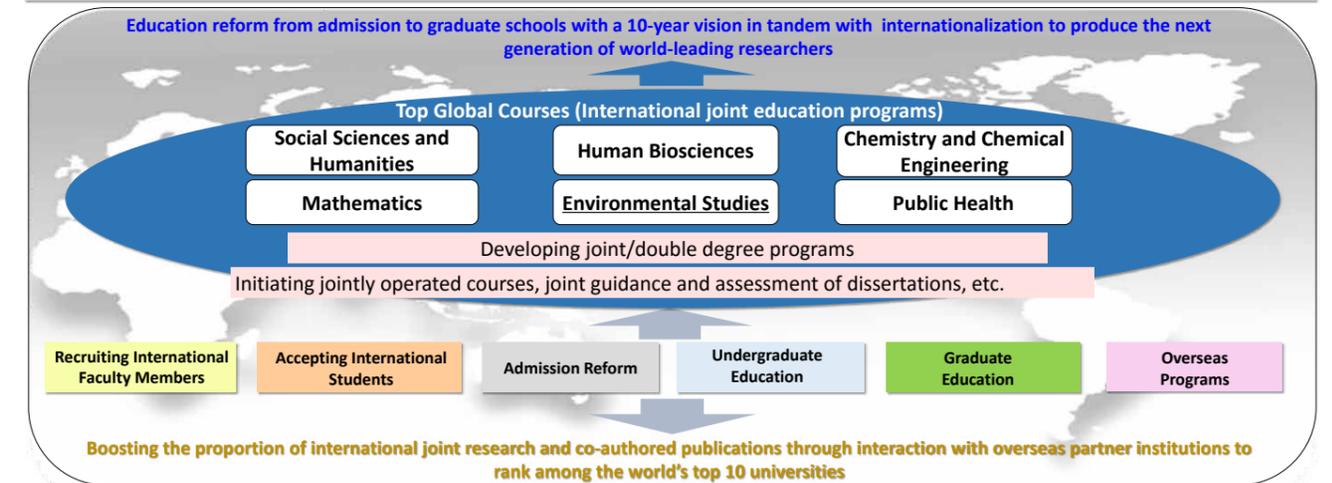
Fig. Flow and new schemes of the JSPS Core-to-Core Project

**On Going Activities.....** For constructing the study basis for Global Environmental Studies, JSPS Core-to-Core Project launched GSGES Seeds Funding which supports study projects of young researchers in partnership universities. Eleven researchers were selected for GSGES Seeds Funding through screening of application materials and interviews via VCS. JSPS Core-to-Core Project is trying to make matching between the awarded researchers and this can be a first step for further collaboration.

# Japan Gateway: Kyoto University Top Global Program

The Graduate School of Economics, Graduate School of Letters, The Graduate School of Agriculture, The Graduate School of Medicine (Majors in Medicine and Medical Science), The Graduate School of Engineering (Six chemistry-based departments), The Graduate School of Science (Division of Mathematics and Mathematical Sciences, Research Institute for Mathematical Sciences), \*The Graduate School of Global Environmental Studies, The School of Public Health, Kyoto University

**【Program Summary】** The project will establish international joint education programs called "Top Global Courses" at graduate schools covering research areas in which KU has significant international competitiveness, which will be implemented in partnership with universities that are world leaders in their respective fields. As well as initiating courses that are jointly operated with partner institutions and providing joint guidance and assessments of dissertations under "Super Global Courses" in the respective research areas, we will develop joint/double degree programs. Through the synergetic effects of internationalization of graduate education arising out of these initiatives and from internationalization of various aspects of undergraduate education including admission reform, promotion of employment of non-Japanese faculty members, increasing inbound and outbound student mobility, and offering more courses in English, the project is aimed at further reinforcing the university's strengths in research and education to produce the next generation of world-leading researchers.



Social Sciences and Humanities	Human Biosciences	Chemistry and Chemical Engineering
<p>The Social Sciences and Humanities section of this program involves the three Graduate Schools of Economics, Letters and Agriculture. Embracing sustainability and transculture as common keywords, in cooperation with international partner institutions in each research area (University of Glasgow, Wageningen University, Copenhagen Business School, Renmin University of China, Chulalongkorn University, Heidelberg University, University of Göttingen, etc.), we have established an international collaborative education program with a view to introduction of a joint degree system (JD) and a joint certificate system. Serving as a hub for interaction between students and young researchers from East Asian, Southeast Asian and Western countries, we aim to develop individuals with a global outlook founded on an Asian perspective who can contribute to sustainable global development and construction of multicultural societies based on coexistence.</p>	<p>In the field of human biosciences, members of our faculty have been awarded a number of prestigious international prizes, including the Nobel Prize in Physiology or Medicine, the Robert Koch Prize and the Albert Lasker Award for Basic Medical Research. To further strengthen the university's world top-class research capabilities and presence, we will endeavor to build a framework for stronger education and research partnerships with our overseas partners, including McGill University, the University of Bordeaux, the Pasteur Institute and Imperial College London, in areas centering on genomic medicine. Through implementation of international joint education/degree programs, we will seek to encourage interaction among top researchers and students worldwide to produce individuals who can compete on the international stage, and to present a model for international academic networking with the aim of further enhancing Kyoto University's global reputation.</p>	<p>The six chemistry-based departments of the Graduate School of Engineering, which makeup the Chemistry and Chemical Engineering section of this program, constitute one of the world's largest graduate schools in the field of chemistry. The school covers a broad spectrum of education and research, from molecular-level theoretical analysis through responses to global environmental and energy issues. Members of our faculty have been awarded major global prizes, including the Nobel Prize in Chemistry and the Humboldt Prize. In this section, taking full advantage of the strengths of these departments, we aim to establish an education system of international caliber by introducing educational programs in which most (or, in the case of doctoral programs, all) lectures are conducted in English, including intensive lecture courses provided by faculty members from our overseas partners, such as MIT, with the aim of encouraging graduate students to develop broader perspectives and an international mindset, while increasing the number of high-quality international students.</p>
<p><b>Mathematics</b></p> <p>In the field of mathematics, Kyoto University boasts a group of researchers of the highest international caliber, who have recorded a significant number of pioneering research achievements, covering a wide range of subjects in the mathematical sciences and winning numerous world-renowned prizes, including the Fields Medal. Under the joint research guidance provided by these distinguished Kyoto University faculty members as supervisors and by top researchers from overseas as co-supervisors, graduate students can pursue their research for doctoral dissertations in an international environment, which is designed to equip them with superior research skills in mathematics and proficiency in foreign languages. Within academic year 2015, three of our graduate students are expected to receive doctoral degrees under the co-supervision of researchers from UCLA, University of Bonn and Rutgers University. By building their own international research networks, whilst making their dissertations available to the international research community, students will have more opportunities to play active roles on the international stage.</p>	<p>The Environmental Studies section, comprising Graduate School of Global Environmental Studies and Graduate School of Agriculture, covers a number of fields, including natural sciences, social sciences and humanities. We conduct interdisciplinary and practical education and research that contribute to endeavors in relation to environmental issues. In educational activities, along with presenting cases of pioneering endeavors by inviting such renowned researchers as Mr. Lester R. Brown from the Earth Policy Institute and Professor Rattan Lal from Ohio State University, we are working to further expand the double-degree programs with Gadjah Mada University, Bogor Agricultural University, Mahidol University and Kasetsart University, and to establish new international education programs with other universities whilst conducting internship programs, International Spring School to promote internationalization of our educational programs. In research activities, our environmental technologies have received high ratings, as evidenced by receipt of the Excellence Award in the Nikkei Global Environmental Technology Awards (Hitoshi Shinjo et al.).</p>	<p>Aiming to create a world premium public health graduate school that leads global healthcare in the 21st century, we have established an Internationalization Promotion Office within the School of Public Health to vigorously promote interdisciplinary and international approaches to our educational programs and internationalization of our degree programs whilst collaborating with major universities in ASEAN, East Asia, America and Europe in order to promote international exchange focused on young researchers. We have translated teaching materials into English for required courses and certain elective courses, as well as creating an English version of our website, thereby improving our English language capabilities for educational and public relations purposes. We also organized an international conference inviting young researchers from 13 major universities on five continents. In addition, we provided many opportunities for interaction between our students and faculty members and those of our international partner institutions (inviting/dispatching) in order to encourage international research collaboration.</p>

# Environmental Innovator Program (EIP) - Cultivating Environmental Leaders across the ASEAN Region

Project Leader: Prof. Shigeo Fujii (Graduate School of Global Environmental Studies)

The *Environmental Innovator Program (EIP) — Cultivating Environmental Leaders across the ASEAN Region* is a new program at the Graduate School of Global Environmental Studies (GSGES), Kyoto University. It aims to strengthen our research and educational capacity through an intensive program of academic exchanges involving 11 partner universities throughout the ASEAN region.

Rapid economic growth in the ASEAN region has created serious environmental and social problems, ranging from water degradation and improper waste management to traffic congestion and deforestation. At the same time, business relationships and academic networks between ASEAN countries and Japan have been steadily increasing.

Against such a backdrop, the Environmental Innovator Program (EIP) aims to cultivate the development of environmental innovators who can perform a leadership role, possess a deep understanding of ASEAN cultures and have excellent communication skills in local languages so that they are equipped to effectively tackle environmental challenges. A great deal of emphasis is, therefore, put on the creation of a double-degree master's program.

## Our Goals

- I. Establishing a double-degree master's program involving GSGES at Kyoto University and partner universities in ASEAN countries
- II. Establishing an international network with 11 universities in ASEAN regions in order to foster collaborative research and educational programs
- III. Establishing a global consortium in conjunction with Japanese companies

## Our Partner universities

EIP program is carried out by GSGES, Kyoto University, and 11 partner universities across ASEAN region. Our network covers across ASEAN and East Asia region— partnership universities are from Thailand, Vietnam, Indonesia, China, Malaysia, and Cambodia.



## Double Degree Program

In the double degree program, students study for three years and earn two Master degrees from Kyoto University and a partner university. Their research and cultural experiences in Kyoto and ASEAN will surely advance their research, communication skills, and career path.



# Institute of Advanced Energy

## ABOUT US

The Institute of Advanced Energy (IAE) was established to promote researches to sophisticate the generation, conversion, and utilization of energy. Our goals are

- (a) to conduct pioneering research on advanced energy science and technology,
- (b) to propose solutions to energy and environmental issues associated with a rapid global population expansion, and
- (c) to contribute to the sustainable progress of humankind.

We perform comprehensive approach towards development of next-generation energy systems, which have the potential to replace existing energy systems, with two viewpoints, quality (harmonization with the environment) and quantity (social infrastructure). In order to secure sustainable energy resources, our research activities emphasize improving the performance of energy systems, developing new energy resources, and realizing systems for effective use of energy resources.

Moreover, through these endeavors, we aim to foster scientists and engineers who possess advanced knowledge and skills in energy science and technology. To meet our objectives, we strive to further develop the research field of advanced energy by building an energy system that has high social receptivity, as well as by developing a system capable of incorporating various sources of energy. Human and research resources at IAE, which are from diverse academic backgrounds, will be strengthened and organically coordinated among different research fields, thereby promoting interdisciplinary and fused research. Additionally, IAE serves as a hub for advanced energy research in Japan and around the globe.

These activities will further pioneer and develop advanced energy research to bridge us to the next generation and contribute to the growth of society.

## HISTORY

The Institute, established in 1971 as the Institute of Atomic Energy, was renamed on May 11, 1996, to the Institute of Advanced Energy with the consolidation of Plasma Physics Laboratory, to represent its research interests in advanced and socially acceptable energy systems in the entire processes of energy generation, conversion and utilization. The former Institute of Atomic Energy, the predecessor of which was the Engineering Research Institute founded in 1941 as originally seeking to carry out synthetic studies of engineering through the cooperative work of specialists in different fields, has sought since 1971 to assume part of the responsibility for peaceful applications of atomic energy and has performed various kinds of fundamental researches in nuclear engineering.

The recent rapid expansion of the research fields at the Institute of Atomic Energy toward various fields of energy sciences, such as systems engineering for social and environmental energy systems, advanced energy conversion researches in quantum engineering, physico-chemistry and materials science, consequently has brought about the new institute i.e., the Institute of Advanced Energy in search of advanced and socially acceptable energy systems.

The Institute of Advanced Energy had joined to the Kyoto University 21st Century COE program named "Establishment of COE on Sustainable Energy System" from 2002 with Graduate School of Energy Science and Radio Science Center for Space and Atmosphere, Kyoto University.

## Joint Usage/research Center for Zero-Emission Energy Research

Zero-emission energy refers to energy that emits no or minimal harmful substances or greenhouse gases such as carbon dioxide. It also refers to advanced, environmentally friendly energy systems that minimize environmental impact and energy losses. Zero-emission energy is the key to solving global energy problems and environmental issues once and for all.

As a joint usage/research center for zero-emission energy research certified by the Ministry of Education, Culture, Sports, Science and Technology of Japan, the Institute of Advanced Energy (IAE) strives to meet the demands of the diverse energy-related research community and the international community regarding issues of energy, the environment, and resources. We pursue joint usage and joint research projects related to zero-emission energy with researchers from around Japan, and strive to educate and foster innovative researchers who will continue with these efforts.

IAE is designated as a joint usage/research center for advancing zero-emission energy research.

We will open new frontiers in zero-emission energy by meeting the demands of the research community and pursuing joint usage and joint research projects.

