

**Kyoto University**

**Human Security Engineering Education  
Program**

**Doctoral Course**

Integrated Engineering Course, Human Security Engineering Field  
(Human Security Engineering Education Program)  
Graduate School of Engineering

Human Security Engineering Advanced Course  
Graduate School of Global Environmental Studies



2021

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## **(1) What is the Human Security Engineering Education Program?**

Educational objective:

Motivating creative, international and independent researchers and engineers with training in four related academic fields.

To achieve the educational objectives of the Human Security Engineering Education (HSE) Program, we provide the HSE courses of the program, the basic subjects in the four academic fields, and the overseas internship through the English language. The Graduate School of Engineering (three departments related to the undergraduate school of Global Engineering), the Hall of Global Environmental Research, the Graduate School of Global Environmental Studies and the Disaster Prevention Research Institute are participating in this program and responsible for training and research.

## **(2) Educational Policy**

Our policy is intended for doctoral students to provide interdisciplinary and solid education in the core fields and four related fields (urban governance, urban infrastructure management, health risk management, and disaster risk management). The study of these topics will equip researchers and engineers with the ability to apply their knowledge in an integrated manner toward ensuring urban human security, as well as the ability to promote these technologies. Specifically, we aim to promote researchers and engineers who possess sophisticated creativity (in addition to having a wide range of knowledge, the ability to go beyond the boundaries of the existing specialized fields), internationality (the ability to present and debate research in English, perform education and research activity in foreign countries, ability to build international human networks), and independence (the ability to plan research, leadership in education and research, ability to secure research funds, and problem-solving ability in the field). To achieve the educational objectives above, we designate “Human Security Engineering” as the compulsory subject for all students and include English instruction in our courses. Additionally, to enable students at the overseas campuses to participate in the program, we will also provide intensive lectures at the sites through a remote lecturing system and e-Learning system.

## **(3) HSE Program Students**

The following students can be admitted to HSE program.

- a) The doctoral student who entered the Graduate School of Engineering (related to the undergraduate school of Global Engineering) and is assigned to the Integrated Engineering Course, Human Security Engineering Field (Doctoral Course: 3rd Year).
- b) The doctoral student of the Graduate School of Global Environmental Studies who selected the “Human Security Engineering Advanced Course.”

**(4) HSE Program: Subjects Available for Study**

Code	Subject	Teasher(s) in Charge	Hrs/Week		Credits	Course Specification				Available for	
			1st Semester	2nd Semester		Core subject	Major subject	ORT subject	Minor subject	Master course	Doctoral course
10X301	<b>Human Security Engineering</b>	<b>Yondea, Tachikawa, Tatano, Matsushima, Asari</b>		2	2	○				Compulsory (5 years cours)	Compulsory (3 years course)
10X305	Lectures on Urban Governance 1 (*)	Assorted Instructors	2		2		○		○		○
10X307	Lectures on Urban Governance 2 (*)	Assorted Instructors		2	2		○		○		○
10X311	<b>Urban Infrastructure Management</b>	<b>Tachikawa and Assorted Instructors</b>	2		2	○	○		○	○	○
10X315	Lectures on Urban Infrastructure Management 1 (*)	Assorted Instructors	2		2		○		○		○
10X317	Lectures on Urban Infrastructure Management 2 (*)	Assorted Instructors		2	2		○		○		○
10X321	<b>Lectures on Environmental Risk Management Leader</b>	<b>Shimizu</b>	2		2	○	○		○	○	○
10X323	Lectures on Health Risk Management 1 (*)	Assorted Instructors	2		2		○		○		○
10X325	Lectures on Health Risk Management 2 (*)	Assorted Instructors		2	2		○		○		○
10F456	New Environmental Engineering I	Shimizu, Echigo, Nishimura	2		2		○		○	○	○
10F458	New Environmental Engineering II	Takaoka, Ueda, Fujimori, Oshita		2	2		○		○	○	○
10X750	Management of Global Resources and Ecosystems	Funakawa, Shibata, Yamashita	2		2		○		○	○	○
10X751	Environmental Ethics and Environmental Education	Asari, Singer	2		2		○		○	○	○
10X333	<b>Disaster Risk Management</b>	<b>Tatano, Yokomatsu, Smaddar</b>	2		2	○	○		○	○	○
10X335	Lectures on Disaster Risk Management 1 (*)	Assorted Instructors	2		2		○		○		○
10X337	Lectures on Disaster Risk Management 2 (*)	Assorted Instructors		2	2		○		○		○
10X339	Internship for Human Security Engineering (Short)				2			○		○	○
10X341	Advanced Capstone Project (Long)				8			○		○	○
	Rsearch Paper (Doctoral)										

**Note:**

- 1) All lectures are conducted in English. The outline of each subject is described in p.6-10
- 2) Prepare the course plan of the subjects by the following procedure and submit the plan to your supervisor to obtain their approval at school entry. Although the course plan can be modified when proceeding to the next grade, the approvals to the supervisor(s) must be obtained. The supervisor cannot modify the additional conditions.
- 3) Graduate-level subjects not included in this table may be considered as corresponding and equivalent to minor subjects under the instruction of your supervisor(s) for up to 4 credits.
- 4) (\*)Subjects are custom-made. If you wish to take (\*)subjects, you must submit an “Registration Request Form for HSE Custom-made lecture” per subject to the C Cluster Office. The form is available at the C Cluster Office.
- 5) The subjects with white circles (○) in the both columns of Master and Doctoral course of the Registration Type on the Subject List are available for credits in Doctoral course, only if you have never acquired those subjects in Master course

**(5) Program Accreditation**

Students who proceed to the Integrated Engineering Course, Human Security Engineering Field, will complete the doctoral course by fulfilling the completion requirements of this field, rather than those of the department to which he/she belongs. Upon completion of the field, the student will be certified as a “Human Security Engineering Education Program Graduate” and will be conferred the program certificate aside from the doctoral degree certificate.

Subject	Number of Credits Required for Completion
Core subject (HSE)	2 or more
Core subject	2 or more
ORT subject	2 or more
Major subject	0 or more
Minor subject	0 or more
Other subject	To be taken obtaining the approval of the supervisor as needed
Total	10 or more

1. Students who have achieved 2 credits in the compulsory core subject “Human Security Engineering.”
2. Students who have achieved at least 1 subject (2 credits) from the core subjects (Urban Infrastructure Management, Lecture on Environmental Risk Management Leader, Disaster Risk Management).
3. Students who have achieved at least 2 credits of the ORT subjects.
4. Students who have achieved at least 10 credits from the HSE Program subject table above. However, the subjects of the graduate school that are not included in the HSE Program subjects table above can be certified as the required credits for the completion under the supervisor(s) only if the total number of the credits is equal to or less than 4.
5. Students who have completed the doctoral research in accordance with the spirit of the HSE Program.

## **(6) Course Descriptions for Human Security Engineering Education Program**

### **Human Security Engineering [Compulsory Core subject]**

YONEDA Minoru, TACHIKAWA Yasuto, MATSUSHIMA Kakuya, TATANO Hirokazu , ASARI Misuzu.

Second semester: Wednesday, 16:30–18:00

This course will provide a comprehensive overview of human security engineering, a system of technologies for designing and managing cities that enable inhabitants to live under better public health conditions, and also to live free from potential threats of large-scale disasters and environmental destruction. The Millennium Development Goals will be evaluated from the viewpoints of four existing fields: urban governance, urban infrastructure management, health risk management, and disaster risk management. Furthermore, we will provide lectures that explore the relationships between the four existing fields.

#### **Lectures on Urban Governance 1**

Assorted Instructors

Custom-made Lecture

This class will cover the hot topics on urban governance within human security engineering. Instructors will present current literature and expect students to develop arguments.

#### **Lectures on Urban Governance 2**

Assorted Instructors

Custom-made Lecture

In this class, research topics related to urban governance within human security engineering will be assigned to students to enable them to solve human security problems. The students are required to review the latest or important fundamental papers, including related areas, and debate ideas with their teachers.

### **Urban Infrastructure Management [Core subject]**

TACHIKAWA Yasuto and Assorted Instructors

First semester: Monday, 13:00–14:30

This course aims to provide interdisciplinary knowledge on how urban infrastructure is managed, not only from an economic perspective but also in accordance with human security engineering. The lectures will consist of the following topics: (1) Urban Infrastructure Asset Management, (2) Urban Environment Accounting System, (3) Urban Energy Supply Management, (4) Urban Food/Water Supply Management, and (5) Urban Transport/Logistics Management.

#### **Lectures on Urban Infrastructure Management 1**

Assorted Instructors

Custom-made Lecture

This class aims to deepen the understanding on urban infrastructure management, especially related to human security engineering. The class will present and discuss hot topics and related literatures on urban infrastructure management.

### **Lectures on Urban Infrastructure Management 2**

Assorted Instructors

Custom-made Lecture

In this class, the Assorted Instructors will provide lectures on the current situation and future prospect of the challenges of urban infrastructure management related to urban human security engineering. The aim of this class is to develop advanced and practical research capability of the students. To achieve this, they will be assigned with research subjects and will present and discuss their findings.

### **Lecture on Environmental Risk Management Leader [Core subject]**

FUJII Shigeo, SHIMIZU Yoshihisa , TANAKA Hiroaki

First semester: Thursday, 16:30–18:00

In this class, we will give lectures on the theories of risk analysis, risk identification, risk assessment, risk evaluation, and risk reduction for human health and ecology. The main purpose of this lecture is to provide the students with the basic knowledge required of environmental leaders who can solve environmental issues practically as they occur in developing countries. We will review several international environmental projects as case studies.

### **Lectures on Health Risk Management 1**

Assorted Instructors

Custom-made Lecture

This class will provide an overview of health risk management, especially as they relate to human security engineering. The class will present and discuss the hot topics and related literatures on health risk management.

### **Lectures on Health Risk Management 2**

Assorted Instructors

Custom-made Lecture

This class will provide lectures on the current situation and future challenges of human health risk management from the viewpoint of urban human security engineering. The aim of this class is to develop the student's research capability. Students will be assigned academic and practical research subjects, and will then present and discuss their findings.

### **New Environmental Engineering I**

SHIMIZU Yoshihisa, ECHIGO Shinya, NISHIMURA Fumitake

First semester: Monday, 16:30–18:00

This course provides various kinds of engineering issues related to the water environment in English, which cover fundamental knowledge, the latest technologies and regional application examples. These lectures, English presentations by students, and discussions enhance English capability and internationality of students.

The course is conducted in simultaneous distance-learning from Kyoto University, or from remote lecture stations in University of Malaya, and Tsinghua University of China. For the distance-learning, a hybrid system is used, which consists of prerecorded lecture VIDEO, VCS (Video conference system) and SS (slide sharing system).

### **New Environmental Engineering II**

TAKAOKA Masaki, UEDA kayo, FUJIMORI Shinichiro, OSHITA Kazuyuki

Second Semester: Monday, 16:30–18:00

This course provides various kinds of engineering issues related to atmospheric environment and solid wastes management in English, which cover fundamental knowledge, the latest technologies and regional application examples. These lectures, English presentations by students, and discussions enhance English capability and internationality of students. The course is conducted in simultaneous distance-learning from Kyoto University, or from remote lecture stations in University of Malaya, and Tsinghua University. For the distance-learning, a hybrid system is used, which consists of prerecorded lecture VIDEO, VCS (Video conference system) and SS (slide sharing system). The students are requested to give a short presentation in English in the end of the lecture course. This course may improve students' English skill and international senses through these lectures, presentations, and discussions.

### **Management of Global Resources and Ecosystems**

FUNAKAWA Shinya, SHIBATA Shozo, YAMASHITA Yo

First semester: Friday, 10:30–12:00

Natural resources can be recycled sustainably by maintaining the environment. Ecosystems can be kept healthy so that organisms can reproduce effectively. This class outlines the characteristics of material circulation in various ecosystems and the link mechanism between ecosystems. We will also consider methods for using natural resources in harmony with ecosystems, after reviewing examples of deteriorated ecosystems and their rehabilitation throughout the world.

### **Environmental Ethics and Environmental Education**

Misuzu ASARI, Jane SINGER

First semester: Tuesday, 16:30–18:00

Ethical approaches and informed decision making are essential for solving environmental problems,



especially to facilitate consensus building among conflicting stakeholders. This course covers prominent schools of thought in the field of environmental ethics, applied ethics in environmental stewardship, and basic principles of environmental education.

### **Disaster Risk Management [Core subject]**

TATANO Hirokazu , YOKOMATSU Muneta

First semester: Wednesday, 14:45–16:15

Natural disasters have low frequencies but high impacts. It is very important to make an integrated risk management plan that consists of various countermeasures such as prevention, mitigation, transfer, and preparedness. This class will present economic approaches to natural disaster risk management and designing appropriate countermeasures.

### **Lectures on Disaster Risk Management 1**

Assorted Instructors

Custom-made Lecture

This class aims provide an overview of disaster risk management, with an emphasis on human security problems. The class will present and discuss hot topics and related literatures on disaster risk management.

### **Lectures on Disaster Risk Management 2**

Assorted Instructors

Custom-made Lecture

This class will provide lectures on the current situation and future challenges of disaster risk management from the viewpoint of urban human security engineering. The aim of this class is to develop advanced and practical research capability of the students. To achieve this, they will be assigned with research subjects and will present and discuss their findings.

### **Internship for Human Security Engineering**

Contact your supervisor(s) to inquire

The internship aims to develop practical capabilities to secure urban human security, in addition to acquiring expert knowledge and the ability to develop new research fields by carrying out research activity related to human security engineering and presenting research results at international conferences. Specific examples include participating in internships domestically or abroad at companies or research institutes which conduct the operation of international projects, conducting field surveys, and attending academic conferences.

### **Advanced Capstone Project**

Contact your supervisor(s) to inquire

This class aims to develop the abilities of international collaboration, field investigation, and on-site

planning/problem solving through long-term investigation/research activities related to human security engineering with thorough hands-on policy in foreign countries. Specific examples include field research at overseas centers and participation in international projects overseas. As a rule, participants will stay in the field for 2 months or more.

### (7) Example Course Plans

#### 1) A student of the field of Urban Infrastructure Management

Course Specification	Code	Subject	Credits	1st Semester	2nd Semester
Compulsory Core subject	10X301	Human Security Engineering	2		○
Core subject Major/minor subject	10X311	Urban Infrastructure Management	2	○	
ORT subject	10X339	Internship for Human Security Engineering (Short)	2	○	○
	or				
	10X341	Advanced Capstone Project (Long)	8	○	○
Core subject Major/minor subject	10X333	Disaster Risk Management	2	○	
Major/minor subject	10X317	Lectures on Urban Infrastructure Management 2	2		○

#### 2) A student of the field of Health Risk Management

Course Specification	Code	Subject	Credits	1st Semester	2nd Semester
Compulsory Core subject	10X301	Human Security Engineering	2		○
Core subject	10X321	Lectures on Environmental Risk Management Leader	2	○	
Major/minor subject	10X323	Lectures on Environmental Risk Management 1	2	○	
ORT subject	10X339	Internship for Human Security Engineering (Short)	2	○	○
	or				
	10X341	Advanced Capstone Project (Long)	8	○	○
Major/minor subject	10X327	New Environmental Engineering II	2		○

## **(8) ORT subjects**

“Internship for Human Security Engineering” (short-term internship: 2 credits) and “Advanced Capstone Projects” (long-term internship: 8 credits) are available for ORT subjects in HSE Program. To conduct each ORT subject, you would contact your supervisor(s) to inquire and make plans for internships with your supervisor’s advice and suggestion.

### **1) Internship for Human Security Engineering**

Internship for Human Security Engineering normally requires 2 weeks (practically 10 days) of on-site training or on-the-research training. Examples of these internship activities as follows:

- (a) Presentation at international conference followed by information collection relevant to your doctoral research at laboratories of foreign universities and authorities.  
(Including online conference or online research activities as an exception in the new coronavirus pandemic)
- (b) Normal internship activities at private companies to study the state of the cutting-edge technologies or practical business.  
(Including online internship as an exception in the new coronavirus pandemic)

### **2) Advanced Capstone Projects**

Advanced Capstone Projects require more than 2 months (practically five-seventh 60days) on-site or research training.

Examples as follows:

- (a) Fieldwork at overseas base for your doctoral research.
- (b) Working as a visiting researcher at agencies/organizations related to Human Security Engineering.

## **NOTICE OF INTERNSHIP**

- 1) Contact your supervisor and make plans for internship with your supervisor’s advice.

Your internship needs your supervisor’s approval.

- 2) Submit the Notice (HSE-004, or HSE-005) and the Internship Pledge (HSE-028) to HSE Center ([kyomu\\_gcoe@hse.gcoe.kyoto-u.ac.jp](mailto:kyomu_gcoe@hse.gcoe.kyoto-u.ac.jp)) **before** starting an internship.

You could access our website (<http://hse.gcoe.kyoto-u.ac.jp>) and download these template files.

- 3) Submit the report on internship (Binding form: HSE-013/014 and Report form: HSE-015) to your supervisor and HSE Center **after completing all internships.**

You could access our website (<http://hse.gcoe.kyoto-u.ac.jp>) and download these template files.

- ✓ You can combine several internships into one. The total length of internships should sum up to 2 weeks or 2 months.
- ✓ As ORT subjects are all-year ones, you must register them at the beginning of the first semester and can get the credit at annual end-of-classes.
- ✓ Students who entered Kyoto Univ. in October can’t register ORT subjects in October. But they can start an internship. They should register ORT subjects next April.
- ✓ Students who want to extend internship to the next year should register internship subject at the beginning of the first semester once more.

## **(9) Portfolio**

Students should submit Kyoto University Human Security Engineering Education Program Portfolio to your supervisor using the e-portfolio system called STEP.

Please access to the following URL using your student number or ECS-ID and fill out all forms you can fill out now.

<https://kar.gakusei.kyoto-u.ac.jp/portal/login/>

We will ask your supervisor to check it and certify what you fill out.

## **(10) Registration**

Student can select the subjects from the table (page 2) (without (\*) subjects) and register them on KULASIS (Kyoto University Student Affairs Information System) (<https://student.iimc.kyoto-u.ac.jp/>)

(See also <http://www.z.k.kyoto-u.ac.jp/freshman-guide/kulasis>)

If you wish to take (\*)subjects (page 2), you must submit an “Registration Request Form for HSE Custom-made lecture” per subject to the C Cluster Office. The form is available at the C Cluster Office.

## **(11) Contact**

Education Coordinator of Human Security Engineering Education Program (HSE)

Associate Professor Yoko SHIMADA

C1-3-464, Katsura Campus C Cluster

Secretary of Human Security Engineering Education Program (HSE)

Chikako TOMISHIMA

C1-3-182, Katsura Campus C Cluster

E-mail: [kyomu\\_gcoe@hse.gcoe.kyoto-u.ac.jp](mailto:kyomu_gcoe@hse.gcoe.kyoto-u.ac.jp)

Website: <http://hse.gcoe.kyoto-u.ac.jp>

# 誓 約 書

## Internship Pledge

人間安全保障工学分野 分野長 殿

To Director of HSE Program

人間安全保障工学分野の講義の一環としてインターンシップあるいは研究調査のため海外渡航する場合は、出国から帰国までの期間中における事故・疾病等については、私自らの責任として対処することを誓約します。

As a participant in the internship program for HSE Internship Subjects, I hereby pledge my agreement to deal with accidents, epidemic diseases etc. during the internship by myself.

年 月 日  
Date: year month day

(渡航者) Traveler(Student)

所 属 専 攻 \_\_\_\_\_  
Affiliation

住 所 \_\_\_\_\_  
Address

氏 名 \_\_\_\_\_ (印)  
Name Signature or Stamp