Tohoku University

International Joint Graduate Program in Resilience and Safety Studies

2024 Academic Year
(updated 2023.03.5)

1. Masters (MC) Curriculum 博士前期課程・修士課程

(1) Core Foundation Subjects 基幹基礎科目

Term	Title	Organizer	Credits
Spring and Fall	Basics of Disaster and Safety Sciences Ⅰ,Ⅱ 災害科学・安全学基礎 Ⅰ,Ⅱ	Professor Tomoki NAKAYA (Environmental Studies) and GP-RSS Faculty	1+1
Date/time and venue: Two-day intensive lecture series TBA at the beginning of each term ※ These lectures are only available to GP-RSS students (not available as pre-credit)			

[Outline]

Understanding the fundamentals of disaster and safety sciences is key to the development of countermeasures against socioeconomic and environmental issues that we face in an increasingly connected global society. This course will cover various topics relevant to current international efforts in in resilience and sustainability. The spring term lectures will primarily focus on resilience research in environmental and engineering, with emphasis on recycling, post-disaster solid waste management, waste water treatment, water quality engineering, public health microbiology, GIS-based approaches in public health mapping and tracking, spatial epidemiology, lasting anthropological impacts of disaster events, and sustainable economic practices. The fall term lectures will delve further into topics related to resilience and sustainability in medicine, agriculture, intercultural studies, and civil engineering. Faculty members who represent the six constituent graduate schools of the GP-RSS will be giving lectures based on their latest work.

The dates for Basics of DSS will be announced at the beginning of each semester, and will be a two-day intensive course. These lectures are only open to students enrolled in the GP-RSS, and are not available as pre-credit. Students must complete both the spring and fall term courses for a total of 2 credits to fulfill their core foundation subject requirements.

[Evaluation]

Based on attendance, in-class participation, groupwork effort, and a final report.

(2) Transdisciplinary Subjects 学際基幹科目 (pages 2 – 14, available as pre-credit)

Term	Title	Organizer	Credits
Spring	Human Security and Global Health ヒューマンセキュリティとグローバルヘルス	Professor Shinichi EGAWA Professor Hitoshi OSHITANI (Medicine)	2

Date/time and venue: Fridays 16:20-17:50 / April 12 - July 26 Class cord: 3sqdeos
Completely online using Google Classroom. If specified Zoom or other platforms may be used.

1. Object and Summary of Class
   To realize the Human Security, i.e. freedom from fear, freedom from want and freedom to live with dignity, students will learn its general concept, history, the current situation and related frameworks and understand the current situation of global health, the role of health cluster and discuss on the problem solution.

2. Goal of study:
   - Describe the concept, history and related international human security frameworks.
   - Explain and use the standard terminology of human security and global health.
   - Find the problems that threaten the health and human security, and plan the research projects for solutions.
   - Describe the current situation and gaps of infectious disease, non-communicable disease, mother and child health, and aging that global health is facing.
   - Describe the cluster approach and the roles and coordination of clusters.

3. Contents and progress schedule of the class:
   Each class is in English. The students are requested actively participate in the class. Group work and/or debate will be also used. If external lecturer is invited, it will be noticed beforehand.
   - Apr. 12 (Fri): Introduction and guidance. General concept and the history of human security (Oshitani, Egawa)
   - Apr. 19 (Fri): Human security and global health governance 1 (Oshitani)
   - Apr. 26 (Fri): Human security and global health governance 2 (Oshitani)
   - May 10 (Fri): One Health. (Imamura)
   - May 17 (Fri): Global Health Landscape (Nomura,KU)
   - May 24 (Fri): Sustainable Development Goals 1 (Egawa)
   - May 31 (Fri): Sustainable Development Goals 2 (Egawa)
   - Jun 7 (Fri): Universal Health Coverage 1 (Egawa)
   - Jun 14 (Fri): Universal Health Coverage 2 (Egawa)
   - Jun. 21 (Fri): Environmental medicine and human toxicology (Akaike)
   - Jun. 28 (Fri): Risk Communication in Global Health (Ochi, JikeiMU)
   - Jul. 5 (Fri): Global situation of non-communicable disease (Egawa)
   - Jul. 12 (Fri): Working toward improving maternal and child health (Goto, FMU)
   - Jul. 19 (Fri): Infectious disease and human security (Kodama)
   - Jul. 26 (Fri): Nutrition and human security (Egawa)
4. Evaluation method:
   Attendance, Interactive mini post-test, Active participation in group work and/or debate.
5. Preparation and Review
   The students are required to actively brush up of English and pre-, post-search of relevant information for discussion using the following URLs.:
   - World Health Organization (WHO) THE GLOBAL HEALTH OBSERVATORY
     http://www.who.int/gho/publications/world_health_statistics/2016/en/
   - Universal Health Coverage (UHC)
     http://www.who.int/universal_health_coverage/en/
   - World Life Expectancy
     https://www.worldlifeexpectancy.com/
   - Sustainable Development Goals (SDG):
     http://www.un.org/sustainabledevelopment/sustainable-development-goals/
   - World Bank SDGs Atlas
     https://datatopics.worldbank.org/sdgatlas/
6. Contact:
   Prof. Shinichi Egawa at egawas@surg.med.tohoku.ac.jp
   Office: 022-752-2058, Office hour: 9:00-17:00
   http://www.irides-icdm.med.tohoku.ac.jp/english/index.html

Term	Title	Organizer	Credits
Fall	Health and Social Resilience for Large-Scale Disasters 巨大災害に対する健康と社会のレジリエンス	Professor Shinichi EGAWA (Medicine)	2

Date/time and venue: Fridays 16:20-17:50 / October 11, 2024 - January 31, 2025 Class cord: de3wjnn
Online using Google Classroom (some lecturers might use Zoom)

1. Object and Summary of Class:
   In disaster, many lives are in danger and huge amount of health crisis will threaten human security, i.e. freedom from fear, freedom from want and freedom of life with dignity. Sendai Framework for Disaster Risk Reduction 2015-2030 is the ongoing international framework. Sendai Framework focuses on “health” more than previous frameworks. Multi hazard approach and physical and mental health damage in disaster are key words. This course is aiming to clarify the current situation and gaps in medical and public health preparedness, response, recovery and reconstruction in disaster.

2. Goal of study:
   a. Describe the difference of hazards and disasters.
   b. Explain and use the common terminology of disaster medicine and public health.
   c. Explain the health damage in disaster.
   d. Describe about the SPHERE Project and Psychological First Aid (PFA).
   e. Describe about the medical, public health and welfare response system in disaster.
   f. Describe about the humanitarian aids in disaster and the roles of United Nation’s organizations including WHO.
   g. Describes the current gaps between Sendai Framework and the realities.
   h. Describe about the business continuity plan and the support receiving capacity of the hospital.
   i. Describe about the relationship between disaster and radiation medicine, maternal and child health, public health, infectious disease, medical informatics and comprehensive health care.
   j. Describe about the process of education and training of disaster medicine, public health and welfare

3. Contents and progress schedule of the class:
   Each class will be provided in English. The students are requested actively participate in the class. Group work and/or debate will be also used. If external lecturer is invited, it will be noticed beforehand.

4. Evaluation method
   Attendance, Interactive mini post-test, Attitude in group work and/or debate.

- Oct. 11 (Fri): Introduction, Great East Japan Earthquake (Egawa)
- Oct. 18 (Fri): Disasters in Asia (Egawa)
- Oct. 25 (Fri): Sendai Framework for Disaster Risk Reduction (Egawa)
- Nov. 1 (Fri): Risk Communication in disaster (Ochi, Jikei MU)
- Nov. 8 (Fri): Disaster and public health (Kuriyama)
- Nov. 15 (Fri): Business Continuity Plan of the Hospital (Sasaki)
- Nov. 22 (Fri): Disaster and infectious disease. (Kodama)
- Nov. 29 (Fri): Nuclear and radiological disaster and medical response (Suzuki)
- Dec. 6 (Fri): Disasters due to human-induced hazards (Egawa)
- Dec. 13 (Fri): Disaster and mental health (Kunii)
- Dec. 20 (Fri): Disaster and comprehensive health care (Osaka)
- Jan. 10 (Fri): Maternal and child health in disaster (Saito)
- Jan. 17 (Fri): SPHERE Project and Psychological First Aid (Egawa)
- Jan. 24 (Fri): Disaster and Medical Information (Fujii)
- Jan. 31 (Fri): Prepared community HUG® (Egawa)

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5. Textbook and References:
   - Koenig and Schultz's Disaster Medicine / ISBN 978-1107040755
   - Ciottone's Disaster Medicine / ISBN 978-0323286657
   - DMAT textbook (in Japanese) / ISBN 978-4892698590

6. Preparation and Review:
   The students are required to actively brush up English and perform pre-, post-search of relevant information for discussion using the following URL
   - SPHERE handbook 2018, Sphere Project (available at: https://handbook.spherestandards.org/en/sphere/#ch001
   - Sendai Framework for Disaster Risk Reduction (available at: https://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf

   The students are supposed to participate the discussion actively regardless of their age, gender and ethnicity.

7. Contact
   Prof. Shinichi Egawa at egawas@surg.med.tohoku.ac.jp
   Office: 022-752-2058 (Mon.-Fri. 9:00-17:00)
   http://www.irides-icdm.med.tohoku.ac.jp/english/index.html

Term	Title	Organizer	Credits
Spring	International Development Studies 国際開発学	Professor Katsuhito FUYUKI Assistant Professor Keeni MINAKSHI (Agriculture)	2

Date/time and venue: Tuesdays 14:40-16:10

Aobayama New Campus; Multidisciplinary Research Laboratory for Agricultural Science K01; N212

青葉山新キャンパス 農学系総合研究棟 (K01) N212

[Outline]

This lecture is held every spring semester. Main objective is to develop understanding of the agricultural transformation in developing Asia under the impacts of rapid economic growth, industrialization, urbanization, global warming, and globalization. Students are expected to deepen their understanding on the difference of the social systems or institutions among countries and/or areas. Taking account into such diversified characteristics of economy and agriculture in developing Asian countries, students are expected to concert alternative models and policies as well as to review the general models and policies of development.

Every student is requested to give a presentation in the class once or twice per semester. When a student is appointed as a reporter, he or she must prepare a handout of report based on the assigned chapter of adopted textbook and its related papers.

[Content]

Introduction, contents and progress schedule will be announced at the first class.

Textbook: The World Bank, *World Development Report 2023*.

Download URL: https://www.worldbank.org/en/publication/wdr2023

We use Google Classroom. Class code for joining Google Classroom: ulwiu3l

[Evaluation]

Presentation of textbook 50%, presentation of homework 30%, and discussion 20%

Term	Title	Organizer	Credits
Fall	Food Economics 食料経済学	Professor Keiichi ISHII (Agriculture)	2

Date/time and venue: Tuesdays 14:40-16:10

Aobayama New Campus; Multidisciplinary Research Laboratory for Agricultural Science K01; N212

青葉山新キャンパス 農学系総合研究棟 (K01) N212

[Outline]

The aim of this course is to examine issues related to agricultural and food production, as well as various policy design approaches from an economic viewpoint. Policy design for agricultural production and food security, structural changes in food production and trends in food consumption, agricultural modernization and structural changes, policy issues on food safety and quality, agriculture, and the environment are the main topics. After the presentation on agriculture and food production in Japan and the discussion on related policy issues, we will share the current situation and problems of agriculture, food production, and consumption in the countries of the participants.

Students will come to understand the current situation and problems in agriculture and food sector in different countries through comparative approaches.

[Content]

1) Introduction −Comparative approach for agricultural and food economy−
2) Policy design for agricultural production and food security
3) Structural change of food production and trends in food consumption
4) Agricultural modernization and structural changes
5) Agricultural policies in Japan after the World War 2
6) Agricultural production and poverty reduction
7) International trade in food and agricultural products
8) Policy issues on food safety and quality
9) Agriculture and the environment
10) Food & agricultural issues and policies in the World − Presentations given by participants 1 −
11) Food & agricultural issues and policies in the World − Presentations given by participants 2 −
12) Food & agricultural issues and policies in the World − Presentations given by participants 3 −
13) Food & agricultural issues and policies in the World − Presentations given by participants 4 −
14) Food & agricultural issues and policies in the World − Presentations given by participants 5 −
15) Discussion and understanding from the viewpoint of comparative approach

[Evaluation]

An assessment will be based on class attendance, presentations, in-class participation, and a term paper.

Term	Title	Organizer	Credits
Fall	Environmental Resilience and Energy Security 環境とエネルギーの安全保障問題	Professor Jusen ASUKA (Environmental Studies)	2

Date/time and venue: Tuesdays 13:00-14:30
Kawauchi Campus; Kawakita Research Forum 334 (A07)
川内キャンパス川北合同研究棟 334 (A07)

[Outline]

On the one hand, there is a newly examined problem of environmental security, such as global warming, but on the other hand, traditional energy security and environmental problems still show its importance. This subject will examine the environmental/energy issues around the world from the socioeconomic perspectives. Lecture will be taken seminar form and positive participation of all students is expected. In the class, we discuss the challenges each country faces both to mitigate and to adopt to the problems. In addition, we try to understand that the idea of the security has changed over the course of time through the concrete examples in the world.

[Content]

1. Introduction (Status quo of the energy and environment)
2. Introduction (Status quo of the climate change)
3. Introduction (Relationship between the environment and energy)
4. Student Presentation
5. Student Presentation
6. Student Presentation
7. Student Presentation
8. Student Presentation
9. Student Presentation
10. Student Presentation
11. Student Presentation
12. Student Presentation
13. Student Presentation
14. Student Presentation

[Evaluation]

Presentation and discussion participation.

Term	Title	Organizer	Credits
Spring	Energy and Resource Resilience Strategies 国際資源エネルギー戦略論	Associate Prof. Takuro KOBASHI Prof. Takeshi KOMAI Associate Prof. Atsushi IIZUKA (Environmental Studies)	2

Date/time and venue: Tuesdays 8:50-10:20
Aobyama New Campus; Graduate School of Environmental Studies J22 4F Lecture Room 1
青葉山新キャンパス環境科学研究科本館（J22）4F 講義室 1

[Outline]

What should be done in order to attain a sustainable world? To achieve this issue, it is essential that future leaders can grasp the current situation of energy and resources and think about the outlook for the future with a global perspective. In this class students will learn to identify and systematically evaluate the advantages and disadvantages of the development and consumption of energy and resources with emphasis on sustainability. Climate change requires rapid and substantial changes in the energy systems. However, a rapid decarbonization using renewable forms of energy may cause various kinds of environmental and social burden. The student shall become aware that changes in the use of resources and technologies come at a price but how the transition can be facilitated with adequate measures.

[Content]

- Week 1(Kobashi): Decarbonization pathways and carbon neutral
- Week 2(Kobashi): Renewable energy: solar and wind
- Week 3(Kobashi): Socio-techno-economic energy transition
- Week 4(Hengesbaugh): Impact of climate change on your life
- Week 5(Zusman): International community's response to climate change
- Week 6(Zusman): What are the links between climate change and the SDGs?
- Week 7(Hengesbaugh): Opportunities for addressing climate change through waste management
- Week 8(Zusman): City's actions to address climate change
- Week 9.(Hengesbaugh): The role of multi-stakeholder engagement to advance climate action
- Week 10(Komai): Energy Resources Security and Environmental Risk Management
- Week 11(Komai): Creating sustainable society for development and environmental harmony
- Week 12(Komai): Supply Chain for Metal Resources and Decarbonization
- Week 13(Iizuka): "Metal production and recycling"
- Week 14(Iizuka): "Carbon dioxide Capture, Utilization and Storage (1)"
- Week 15(Iizuka): "Carbon dioxide Capture, Utilization and Storage (2)"
-

Term	Title	Organizer	Credits
Spring	Global Governance and Safety グローバルガバナンスと安全	Professor Tomoki OKAWARA (International Cultural Studies)	2

Date/time and venue: Wednesdays 13:00-14:30
Kawauchi Campus; Multimedia Education and Research Complex A05; Room 303 (M303)
川内キャンパス　マルチメディア教育研究棟（A05） 303 号室 （M303）

[Outline]

Nowadays we encounter global diasporas' issues. What kind of issues they were/ are? In this class, students will understand (1) the definition of global diasporas' issues, (2) issues associated with global diasporas in history, (3) case studies from the global diasporas, and (4) each student then chooses a case study for this subject which they will submit it as the term paper. Issues of global governance associated with global diasporas' issues are to be considered.

[Content]

1. Orientation
2. Research studies of global diasporas (Lecture)
3. Classical notions of Diaspora1
4. Classical notions of Diaspora2
5. Trade and business diasporas1
6. Trade and business diasporas2
7. Mobilizing diasporas in a global age1
8. Mobilizing diasporas in a global age2
9. Global Tribes (Lecture)
10. The Secret of the Jews
11. Legacy of Empire
12. The new Calvinists
13. The spacemen have landed
14. Discussion
15. Review

[Evaluation]

Term paper (60%) and class participation (40%): Presentation and speech in discussion should be considered as class participation points.

Term	Title	Organizer	Credits
Fall	Hydrology 水循環システム論	Appointed Prof. Daisuke KOMORI (Environmental Studies) Professor So KAZAMA (Engineering)	2

Date/time and venue: Thursdays 14:40-16:10
Aobyama New Campus; Graduate School of Environmental Studies J22 4F Lecture Room 2
青葉山新キャンパス環境科学研究科本館（J22）4F 講義室 2

[Outline]

Water is the most abundant substance on earth, the principal constituent of all living things, and a major force constantly shaping the surface of the earth. It is also a key factor in air-conditioning the earth for human existence and in influencing the progress of civilization.

Hydrology is the science, which deals with the waters of the earth, their occurrence, circulation and distribution on the planet, their physical and chemical properties and their interactions with the biological environment, including their responses to human society. Practical applications of hydrology are found in such tasks as the design and operation of hydraulic structures, water supply, wastewater treatment and disposal, irrigation, drainage, hydropower generation, flood control, navigation, erosion and sediment control, salinity control, pollution abatement, recreational use of water, and fish and wildlife protection.

This lecture focuses to study hydrology based on physical (Hydrological processes, Hydrological model) and statics approaches (Frequency analyses, Temporal and spatial analyses) for analyzing the problems by changes in the distribution, circulation, or temperature of the earth's waters, and to provide guidance for the planning and management of the watershed environment in view of economics and politics. Further, this lecture also focuses to study the interaction between water and human society (Socio-Hydrology), we will have discussions about human security in the watershed environment and water-related disasters.

[Contents]

#01 Outline of course, Brief introduction

-- 1st part: Physical water processes --

#02 Atmospheric processes

#03 Rainfall and evapotranspiration

#04 Surface and subsurface flow

-- 2nd part: Watershed environment and management --

#05 Storage and dams

#06 Ecology and Water

#07 Watershed management/Integrated watershed management

-- 3rd part: Social science aspect of water --

#08 Water Law (River Law in Japan) and water policy

#09 Water conflict

#10 Water economics

#11 Interaction between water and human society (Socio-Hydrology)

#12 World disasters and Human Security (1)

#13 World disasters and Human Security (2)

-- 4th part: Discussion on watershed environment and management --

#14 Group presentation and discussion

#15 Group presentation and discussion

[Evaluation]

Based on assignments and presentations.

Term	Title	Organizer	Credits
Fall	Disaster Control System 防災システム論	Professor Fumihiko IMAMURA Professor Shunichi KOSHIMURA Assistant Professor Shosuke SATO	2

Date/time and venue: To Be Announced in September Tentatively: Fridays 14:40-16:10

Civil Engineering and Architecture Education and Research Building 2F 203, Aobayama Campus

[Outline]

We will organize the circumstances, actualities and tasks of disaster prevention measures centering on natural disasters in our country and lecture on systems and disaster prevention information that respond to individual disaster events. In addition, we will introduce disaster size comparison, disaster statistics, disaster prevention map and so on, to build a practical disaster prevention system.

Background of disaster prevention measures and reality / tasks

Characteristics of natural disasters and countermeasures in our country - Natural environment and disasters, before hour · during · post hoc

Disaster response system - initial structure, emergency response, restoration / reconstruction, self-help assistance aid

[Contents]

1. Introduction of Disaster Reduction System
2. Natural disaster and countermeasure in Japan
3. Earthquake and geo-disaster
4. Tsunami and flood
5. Soil and water disaster
6. Disaster response system and plan
7. Disaster information and transfer system
8. Information and recognition
9. Issues on disaster information
10. Identification of each disaster
11. DIG (Disaster Imagination Game) and community map for disaster prevention
12. Main disasters in terms of information
13. Presentation and discussion for each selected subject

[Evaluation]

Reports, presentation, and final examination.

(3) International Practicals　国際実践科目

Term	Title	Organizer	Credits
Spring	Global Leadership I, II グローバルリーダー実践演習Ⅰ, Ⅱ	Professor Kazuyo MATSUBAE (Environmental Studies) and GSES Faculty	1+1

Date/time and venue: Graduate School of Environmental Studies (GSES) Summer School
※ Dates TBA at the beginning of the Spring Term

[Outline]

Hands-on experiences in organizing academic events are paramount assets to have as researchers who intend to collaborate internationally. Students will partake in practical exercises on international cooperation and leadership as they co-host and organize a summer school with students from the International Environmental Security Leadership Program (IESLP) at the Graduate School of Environmental Studies (GSES). Each year, the GSES Summer School will have a theme central to resilience and sustainability, and have invited speakers from our overseas affiliates who are in the forefront of research their respective fields.

Students will be asked to help organize the Summer School, individually present their research projects, and participate in groupwork discussions. Academic writing support may be offered in some years, depending on the central theme. Extracurricular activities such as excursions may also be offered.

Details (dates, registration, etc.) will be announced in April. For more information, please refer to the GSES website http://www.kankyo.tohoku.ac.jp/

Due to pandemic restrictions on travel and social gatherings, we anticipate this year's summer school to be online.

[Evaluation]

Attendance (full attendance is mandatory), individual presentations, and participation in groupwork.

(4) Masters Practicum　　MC 研修科目

Term	Title	Organizer	Credits
Spring and Fall	Disaster and Safety Science Masters Practicum 災害科学・安全学実践研修	GP-RSS Students and Faculty	2

Date/time and venue: Summer/winter school attendance at your school of choice

[Outline]

MC students are encouraged to seek and attend summer/winter schools with potential collaborators, universities with overlapping areas of research interest, or those hosted by our program affiliates (please refer to our website for details on which universities we have a working relationship with). The objective of this practicum is for students to broaden their academic horizons, network with potential collaborators in preparation for their doctoral research residency (see Doctoral Curriculum), and experience Problem-Based Learning (PBL) critical to developing meaningful doctoral research work in the GP-RSS.

Summer/winter schools should be equivalent to 2 credits at Tohoku University, or a 1-2 week experience abroad (longer research stays are accepted). Intensive international seminars and workshops are also acceptable alternatives, however, the cumulative effort for the course or research experience must be equivalent to the above. Students are highly encouraged to seek experiences specific to their interests, but all summer/winter school attendances must be approved in advance by the GP-RSS Office. If budget is available, applications for travel expenses may be made to the GP-RSS Board via the Office, however, tuition expenses cannot be covered (please plan for this expense through your research assistantship, and discuss this with your supervisor if you need additional financial support).

Invitations to the following programs may be announced as they become available (this may vary from year to year, so please plan EARLY):

・UNU-EHS / U-Bonn Modules in Global Health

・UNU-IAS Global Seminar Shonan Sessions

・Harvard University Reischauer Institute of Japanese Studies: Japan Disasters Archive workshop with IRIDeS

・Additionally, each year, a student from the Graduate School of Environmental Studies is eligible for a position in the Regional Environment and Sustainable Development (RESD) program, and may participate in student exchanges with Tsinghua University, KAIST, POSTECH, and Kanazawa University.

[Evaluation]

Attendance (full participating is mandatory); any groupwork, exams, or reports as stipulated by the organizers of the event.

2. Doctoral (DC) Curriculum 医学履修課程・博士後期課程

(1) Core Development Subject 基幹発展科目

Term	Title	Organizer	Credits
Spring	Disaster and Safety Sciences Doctoral Seminar 災害科学・安全学発展講義	Professor Osamu MURAO (IRIDeS)	2

Date/time and venue: APRU Summer School (TBA in the beginning of the spring semester)

[Outline]

Doctoral students are tasked with deepening their knowledge and acquiring practical experiences in disaster and safety sciences through lectures and fieldwork offered by The APRU Summer School.

Tohoku University has played an important research role in the recovery of the Great East Japan Earthquake and Tsunami in 2011, and continues to cooperate with the local government and community. This Summer School intends to share the expertise and knowledge gained through 10+ years of recovery with the world and generations beyond. The Association of Pacific Rim Universities (APRU) is a network of 50 premier research universities from 16 economies around the Pacific Rim. The APRU and IRIDeS jointly initiated the Multi-Hazards (MH) Program in 2013 with the aims of harnessing the collective capabilities of APRU universities for cutting-edge research on disaster risk reduction (DRR) as well as contributing to international policy making processes on DRR. The APRU Summer School is one of the key activities under the MH Program. This summer school is designed to teach from the experience of the recovery efforts by local governments, NGOs, and academic institutions. Lectures include both natural and social science aspects to encourage learning and understanding the diversifying needs and factors of disaster risk reduction (DRR).

The main learning objectives of the summer school are to:

- understand the mechanism of the international DRR strategy
- learn from the experience and recovery process from the 2011 Great East japan Earthquake and Tsunami
- learn from various DRR projects that have been implemented in the Tohoku region and overseas
- discuss the role of science and technology as well as universities in the implementation of the Sendai Framework for Disaster Risk Reduction

Please discuss with the GP-RSS Office if your doctoral research residency clashes with the APRU Summer School dates (please do so EARLY).

[Evaluation]

Full attendance and a final report.

(2) Transdisciplinary Development Subjects 学際発展科目 (pages 18 – 30)

Term	Title	Organizing Faculty	Credits
Spring	Advanced Global Health グローバルヘルス特論	Professor Shinichi EGAWA Professor Hitoshi OSHITANI (Medicine)	2

Date/time and venue: Fridays 16:20-17:50 / April 12 - July 26 Class cord: 3sqdeos
Completely online using Google Classroom. If specified Zoom or other platforms may be used

1.Object and Summary of Class

To realize the Human Security, i.e. freedom from fear, freedom from want and freedom to live with dignity, students will learn its general concept, history, the current situation and related frameworks and understand the current situation of global health, the role of health cluster and discuss on the problem solution.

2.Goal of study:

- Describe the concept, history and related international human security frameworks.
- Explain and use the standard terminology of human security and global health.
- Find the problems that threaten the health and human security, and plan the research projects for solutions.
- Describe the current situation and gaps of infectious disease, non-communicable disease, mother and child health, and aging that global health is facing.
- Describe the cluster approach and the roles and coordination of clusters.

3.Contents and progress schedule of the class:

Each class is in English. The students are requested actively participate in the class. Group work and/or debate will be also used. If external lecturer is invited, it will be noticed beforehand.

- Apr. 12 (Fri): Introduction and guidance. General concept and the history of human security (Oshitani, Egawa)
- Apr. 19 (Fri): Human security and global health governance 1 (Oshitani)
- Apr. 26 (Fri): Human security and global health governance 2 (Oshitani)
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- May 17 (Fri): Global Health Landscape (Nomura,KU)
- May 24 (Fri): Sustainable Development Goals 1 (Egawa)
- May 31 (Fri): Sustainable Development Goals 2 (Egawa)
- Jun 7 (Fri): Universal Health Coverage 1 (Egawa)
- Jun 14 (Fri): Universal Health Coverage 2 (Egawa)
- Jun. 21 (Fri): Environmental medicine and human toxicology (Akaike)
- Jun. 28 (Fri): Risk Communication in Global Health (Ochi, JikeiMU)
- Jul. 5 (Fri): Global situation of non-communicable disease (Egawa)
- Jul. 12 (Fri): Working toward improving maternal and child health (Goto, FMU)
- Jul. 19 (Fri): Infectious disease and human security (Kodama)
- Jul. 26 (Fri): Nutrition and human security (Egawa)

4.Evaluation method:

Attendance, Interactive mini post-test, Active participation in group work and/or debate.
Doctoral students must submit a research agenda using the designated form once in the semester, The form will be announced in the introduction and available at the Google Classroom.

5.Preparation and Review

The students are required to actively brush up of English and pre-, post-search of relevant information for discussion using the following URLs.:

- World Health Organization (WHO) THE GLOBAL HEALTH OBSERVATORY
http://www.who.int/gho/publications/world_health_statistics/2016/en/
- Universal Health Coverage (UHC)
http://www.who.int/universal_health_coverage/en/
- World Life Expectancy
https://www.worldlifeexpectancy.com/
- Sustainable Development Goals (SDG):
http://www.un.org/sustainabledevelopment/sustainable-development-goals/
- World Bank SDGs Atlas
https://datatopics.worldbank.org/sdgatlas/

6.Contact:

Prof. Shinichi Egawa at egawas@surg.med.tohoku.ac.jp
Office: 022-752-2058, Office hour: 9:00-17:00

http://www.irides-icdm.med.tohoku.ac.jp/english/index.html

Term	Title	Organizing Faculty	Credits
Fall	Advanced Health and Social Resilience for Large-scale Disasters 巨大災害に対する健康と社会のレジリエンス特論	Professor Shinichi EGAWA (Medicine)	2

Date/time and venue: Fridays 16:20-17:50 / October 11, 2024 - January 31, 2025 Class cord: de3wjnn
Online using Google Classroom (some lecturers might use Zoom)

1. Object and Summary of Class:
   In disaster, many lives are in danger and huge amount of health crisis will threaten human security, i.e. freedom from fear, freedom from want and freedom of life with dignity. Sendai Framework for Disaster Risk Reduction 2015-2030 is the ongoing international framework. Sendai Framework focuses on "health" more than previous frameworks. Multi hazard approach and physical and mental health damage in disaster are key words. This course is aiming to clarify the current situation and gaps in medical and public health preparedness, response, recovery and reconstruction in disaster.

2. Goal of study:
   (1) Describe the difference of hazards and disasters.
   (2) Explain and use the common terminology of disaster medicine and public health.
   (3) Explain the health damage in disaster.
   (4) Describe about the SPHERE Project and Psychological First Aid (PFA).
   (5) Describe about the medical, public health and welfare response system in disaster.
   (6) Describe about the humanitarian aids in disaster and the roles of United Nation's organizations including WHO.
   (7) Describes the current gaps between Sendai Framework and the realities.
   (8) Describe about the business continuity plan and the support receiving capacity of the hospital.
   (9) Describe about the relationship between disaster and radiation medicine, maternal and child health, public health, infectious disease, medical informatics and comprehensive health care.
   (10) Describe about the process of education and training of disaster medicine, public health and welfare

3. Contents and progress schedule of the class:
   Each class will be provided in English. The students are requested actively participate in the class. Group work and/or debate will be also used. If external lecturer is invited, it will be noticed beforehand.
   - Oct. 11 (Fri): Introduction, Great East Japan Earthquake (Egawa)
   - Oct. 18 (Fri): Disasters in Asia (Egawa)
   - Oct. 25 (Fri): Sendai Framework for Disaster Risk Reduction (Egawa)
   - Nov. 1 (Fri): Risk Communication in disaster (Ochi, Jikei MU)
   - Nov. 8 (Fri): Disaster and public health (Kuriyama)
   - Nov. 15 (Fri): Business Continuity Plan of the Hospital (Sasaki)
   - Nov. 22 (Fri): Disaster and infectious disease. (Kodama)
   - Nov. 29 (Fri): Nuclear and radiological disaster and medical response (Suzuki)
   - Dec. 6 (Fri): Disasters due to human-induced hazards (Egawa)
   - Dec. 13 (Fri): Disaster and mental health (Kunii)
   - Dec. 20 (Fri): Disaster and comprehensive health care (Osaka)
   - Jan. 10 (Fri): Maternal and child health in disaster (Saito)
   - Jan. 17 (Fri): SPHERE Project and Psychological First Aid (Egawa)
   - Jan. 24 (Fri): Disaster and Medical Information (Fujii)
   - Jan. 31 (Fri): Prepared community HUG® (Egawa)

4. Evaluation method
   Attendance, Interactive mini post-test, Attitude in group work and/or debate.
   Doctoral students should submit a research agenda using the designated form by the end of the term.
   Detailed orientation will be provided at the first class.

(continued from previous page)

5. Textbook and References:
   - Koenig and Schultz's Disaster Medicine / ISBN 978-1107040755
   - Ciottone's Disaster Medicine / ISBN 978-0323286657
   - DMAT textbook (in Japanese) / ISBN 978-4892698590

6. Preparation and Review:
   The students are required to actively brush up English and perform pre-, post-search of relevant information for discussion using the following URL
   - SPHERE handbook 2018, Sphere Project (available at: https://handbook.spherestandards.org/en/sphere/#ch001
   - Sendai Framework for Disaster Risk Reduction (available at: https://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf

   The students are supposed to participate the discussion actively regardless of their age, gender and ethnicity.

7. Contact
   Prof. Shinichi Egawa at egawas@surg.med.tohoku.ac.jp
   Office: 022-752-2058 (Mon.-Fri. 9:00-17:00)
   http://www.irides-icdm.med.tohoku.ac.jp/english/index.html

Term	Title	Organizing Faculty	Credits
Spring	Advanced International Development Studies 応用国際開発学	Professor Katsuhito FUYUKI Assistant Professor Keeni MINAKSHI (Agriculture)	2

Date/time and venue: Tuesdays 14:40-16:10

Aobayama New Campus; Multidisciplinary Research Laboratory for Agricultural Science K01; N212

青葉山新キャンパス 農学系総合研究棟（K01）N212

[Outline]

This lecture is held every spring semester. Main objective is to develop understanding of the agricultural transformation in developing Asia under the impacts of rapid economic growth, industrialization, urbanization, global warming, and globalization. Students are expected to deepen their understanding on the difference of the social systems or institutions among countries and/or areas. Taking account into such diversified characteristics of economy and agriculture in developing Asian countries, students are expected to concert alternative models and policies as well as to review the general models and policies of development.

Every student is requested to give a presentation in the class once or twice per semester. When a student is appointed as a reporter, he or she must prepare a handout of report based on the assigned chapter of adopted textbook and its related papers.

[Content]

Introduction, contents and progress schedule will be announced at the first class.

Textbook: The World Bank, *World Development Report 2023*.

Download URL: https://www.worldbank.org/en/publication/wdr2023

We use Google Classroom. Class code for joining Google Classroom: ulwiu3l

[Evaluation]

Presentation of textbook 50%, presentation of homework 30%, and discussion 20%

Term	Title	Organizing Faculty	Credits
Fall	Advanced Food Economics 応用食料経済学	Professor Keiichi ISHII (Agriculture)	2

Date/time and venue: Tuesdays 14:40-16:10

Aobayama New Campus; Multidisciplinary Research Laboratory for Agricultural Science K01; N212

青葉山新キャンパス 農学系総合研究棟 (K01) N212

[Outline]

The aim of this course is to examine issues related to agricultural and food production, as well as various policy design approaches from an economic viewpoint. Policy design for agricultural production and food security, structural changes in food production and trends in food consumption, agricultural modernization and structural changes, policy issues on food safety and quality, agriculture, and the environment are the main topics. After the presentation on agriculture and food production in Japan and the discussion on related policy issues, we will share the current situation and problems of agriculture, food production, and consumption in the countries of the participants.

Students will come to understand the current situation and problems in agriculture and food sector in different countries through comparative approaches.

[Content]

1) Introduction −Comparative approach for agricultural and food economy−
2) Policy design for agricultural production and food security
3) Structural change of food production and trends in food consumption
4) Agricultural modernization and structural changes
5) Agricultural policies in Japan after the World War 2
6) Agricultural production and poverty reduction
7) International trade in food and agricultural products
8) Policy issues on food safety and quolity
9) Agriculture and the environment
10) Food and agricultural issues and policies in the World − Presentations given by participants in the class 1 −
11) Food and agricultural issues and policies in the World − Presentations given by participants in the class 2 −
12) Food and agricultural issues and policies in the World − Presentations given by participants in the class 3 −
13) Food and agricultural issues and policies in the World − Presentations given by participants in the class 4 −
14) Food and agricultural issues and policies in the World − Presentations given by participants in the class 5 −
15) Discussion and understanding from the viewpoint of comparative approach

[Evaluation]

An assessment will be based on class attendance, presentations, in-class participation, and a term paper.

Term	Title	Organizing Faculty	Credits
Fall	Advanced Environmental Resilience and Energy Security 環境とエネルギーの安全保障問題特論	Professor Jusen ASUKA (Environmental Studies)	2

Date/time and venue: Tuesdays 13:00-14:30
Kawauchi Campus; Kawakita Research Forum 334 (A07)
川内キャンパス川北合同研究棟 334 (A07)

[Outline]

On the one hand, there is a newly examined problem of environmental security, such as global warming, but on the other hand, traditional energy security and environmental problems still show its importance. This subject will examine the environmental/energy issues around the world from the socioeconomic perspectives. Lecture will be taken seminar form and positive participation of all students is expected. In the class, we discuss the challenges each country faces both to mitigate and to adopt to the problems. In addition, we try to understand that the idea of the security has changed over the course of time through the concrete examples in the world.

[Content]

1.Introduction (Status quo of the energy and environment)
2.Introduction (Status quo of the climate change)
3.Introduction (Relationship between environment and energy)
4.Presentation by the student
5.Presentation by the student
6.Presentation by the student
7.Presentation by the student
8.Presentation by the student
9.Presentation by the student
10.Presentation by the student
11.Presentation by the student
12.Presentation by the student
13.Presentation by the student
14.Presentation by the student

[Evaluation]

Presentation and participation to the discussion.

Term	Title	Organizer	Credits
Spring	Advanced Energy and Resource Resilience Strategies 国際資源エネルギー戦略論特論	Associate Prof. Takuro KOBASHI Prof. Takeshi KOMAI Associate Prof. Atsushi IIZUKA (Environmental Studies)	2

Date/time and venue: Tuesdays 8:50-10:20

Aobyama New Campus; Graduate School of Environmental Studies J22 4F Lecture Room 1

青葉山新キャンパス環境科学研究科本館（J22）4F 講義室 1

[Outline]

What should be done in order to attain a sustainable world? To achieve this issue, it is essential that future leaders can grasp the current situation of energy and resources and think about the outlook for the future with a global perspective. In this class students will learn to identify and systematically evaluate the advantages and disadvantages of the development and consumption of energy and resources with emphasis on sustainability. Climate change requires rapid and substantial changes in the energy systems. However, a rapid decarbonization using renewable forms of energy may cause various kinds of environmental and social burden. The student shall become aware that changes in the use of resources and technologies come at a price but how the transition can be facilitated with adequate measures.

[Content]

- Week 1(Kobashi): Decarbonization pathways and carbon neutral
- Week 2(Kobashi): Renewable energy: solar and wind
- Week 3(Kobashi): Socio-techno-economic energy transition
- Week 4(Hengesbaugh): Impact of climate change on your life
- Week 5(Zusman): International community's response to climate change
- Week 6(Zusman): What are the links between climate change and the SDGs?
- Week 7(Hengesbaugh): Opportunities for addressing climate change through waste management
- Week 8(Zusman): City's actions to address climate change
- Week 9.(Hengesbaugh): The role of multi-stakeholder engagement to advance climate action
- Week 10(Komai): Energy Resources Security and Environmental Risk Management
- Week 11(Komai): Creating sustainable society for development and environmental harmony
- Week 12(Komai): Supply Chain for Metal Resources and Decarbonization
- Week 13(Iizuka): "Metal production and recycling"
- Week 14(Iizuka): "Carbon dioxide Capture, Utilization and Storage (1)"
- Week 15(Iizuka): "Carbon dioxide Capture, Utilization and Storage (2)"

Term	Title	Organizing Faculty	Credits
Spring	Advanced Global Governance and Safety グローバルガバナンスと安全特論	Professor Tomoki OKAWARA (International Cultural Studies)	2

Date/time and venue: Wednesdays 13:00-14:30
Kawauchi Campus; Multimedia Education and Research Complex A05; Room 303 (M303)
川内キャンパス　マルチメディア教育研究棟（A05） 303 号室 （M303）

[Outline]

Nowadays we encounter global diasporas' issues. What kind of issues they were/ are? In this class, students will understand (1) the definition of global diasporas' issues, (2) issues associated with global diasporas in history, (3) case studies from the global diasporas, and (4) each student then chooses a case study for this subject which they will submit it as the term paper. Issues of global governance associated with global diasporas' issues are to be considered.

[Content]

1. Orientation
2. Research studies of global diasporas (Lecture)
3. Classical notions of Diaspora1
4. Classical notions of Diaspora2
5. Trade and business diasporas1
6. Trade and business diasporas2
7. Mobilizing diasporas in a global age1
8. Mobilizing diasporas in a global age2
9. Global Tribes (Lecture)
10. The Secret of the Jews
11. Legacy of Empire
12. The new Calvinists
13. The spacemen have landed
14. Discussion
15. Review

[Evaluation]

Term paper (60%) and class participation (40%): Presentation and speech in discussion should be considered as class participation points.

Term	Title	Organizing Faculty	Credits
Fall	Advanced Hydrology 水循環システム論特論	Appointed Prof. Daisuke KOMORI (Environmental Studies) Professor So KAZAMA (Engineering)	2

Date/time and venue: Thursdays 14:40-16:10
Aobyama New Campus; Graduate School of Environmental Studies J22 4F Lecture Room 2
青葉山新キャンパス環境科学研究科本館（J22）4F 講義室 2

[Outline]

Water is the most abundant substance on earth, the principal constituent of all living things, and a major force constantly shaping the surface of the earth. It is also a key factor in air-conditioning the earth for human existence and in influencing the progress of civilization.

Hydrology is the science, which deals with the waters of the earth, their occurrence, circulation and distribution on the planet, their physical and chemical properties and their interactions with the biological environment, including their responses to human society. Practical applications of hydrology are found in such tasks as the design and operation of hydraulic structures, water supply, wastewater treatment and disposal, irrigation, drainage, hydropower generation, flood control, navigation, erosion and sediment control, salinity control, pollution abatement, recreational use of water, and fish and wildlife protection.

This lecture focuses to study hydrology based on physical (Hydrological processes, Hydrological model) and statics approaches (Frequency analyses, Temporal and spatial analyses) for analyzing the problems by changes in the distribution, circulation, or temperature of the earth's waters, and to provide guidance for the planning and management of the watershed environment in view of economics and politics. Further, this lecture also focuses to study the interaction between water and human society (Socio-Hydrology), we will have discussions about human security in the watershed environment and water-related disasters.

[Contents]

#01 Outline of course, Brief introduction

-- 1st part: Physical water processes --

#02 Atmospheric processes

#03 Rainfall and evapotranspiration

#04 Surface and subsurface flow

-- 2nd part: Watershed environment and management --

#05 Storage and dams

#06 Ecology and Water

#07 Watershed management/Integrated watershed management

-- 3rd part: Social science aspect of water --

#08 Water Law (River Law in Japan) and water policy

#09 Water conflict

#10 Water economics

#11 Interaction between water and human society (Socio-Hydrology)

#12 World disasters and Human Security (1)

#13 World disasters and Human Security (2)

-- 4th part: Discussion on watershed environment and management --

#14 Group presentation and discussion

#15 Group presentation and discussion

[Evaluation]

Based on assignments and presentations.

Term	Title	Organizing Faculty	Credits
Fall	Advanced Disaster Control System 防災システム論特論	Professor Fumihiko IMAMURA Professor Shunichi KOSHIMURA Assistant Professor Shosuke SATO	2

Date/time and venue: To Be Announced in September Tentatively: Fridays 14:40-16:10

Civil Engineering and Architecture Education and Research Building 2F 203, Aobayama Campus

[Outline]

We will organize the circumstances, actualities and tasks of disaster prevention measures centering on natural disasters in our country and lecture on systems and disaster prevention information that respond to individual disaster events. In addition, we will introduce disaster size comparison, disaster statistics, disaster prevention map and so on, to build a practical disaster prevention system.

Background of disaster prevention measures and reality / tasks

Characteristics of natural disasters and countermeasures in our country - Natural environment and disasters, before hour · during · post hoc

Disaster response system - initial structure, emergency response, restoration / reconstruction, self-help assistance aid

[Contents]

1. Introduction of Disaster Reduction System
2. Natural disaster and countermeasure in Japan
3. Earthquake and geo-disaster
4. Tsunami and flood
5. Soil and water disaster
6. Disaster response system and plan
7. Disaster information and transfer system
8. Information and recognition
9. Issues on disaster information
10. Identification of each disaster
11. DIG (Disaster Imagination Game) and community map for disaster prevention
12. Main disasters in terms of information
13. Presentation and discussion for each selected subject

[Evaluation]

Reports, presentation, and final examination.

（3） Practicum　DC 海外研修

Term	Title	Organizer	Credits
Spring and Fall	Doctoral Research Residency 博士海外研修	GP-RSS Students and Faculty	8

Date/time and venue: Plans for international collaboration should be finalized and presented to the GP-RSS faculty during their QE1 (in the research portfolio and at the oral exam). Collaborators can be our program affiliates and/or researchers outside of Japan.

[Outline]

Students in the International Joint Graduate Program in Resilience and Safety Studies (GP-RSS) are encouraged to spend six or more months with their overseas collaborator to work on one or more joint publication(s). Collaborators do not need to be from our program's list of affiliated universities, however, students are asked to identify their collaborators by their QE1 (preferably during student selection upon entrance to the program). The GP-RSS may provide travel funding where available, however, we make it very clear that supervisors are responsible for research costs and general student provisioning that cannot be covered in full by our travel funds for students. Applications for additional funding may be placed after the initial funding has been fully utilized.

We hope that students will take advantage of this unique opportunity to network and have meaningful research exchanges with their research counterparts outside of Japan, that will be helpful in their careers. Students should have a clear research plan regarding their research residency by QE1 to be reviewed by Board members, and expect to travel abroad and return to Japan in time for their doctoral defense. Where international travel is not possible due to extenuating circumstances (such as the COVID-19 pandemic where the GP-RSS has taken program-wide precautions regarding student travel), alternative academic activities that are pre-approved by the GP-RSS Board can be accredited. The objective of this research residency remains that the outcome be one or more joint international publication between the student (as first author) and their overseas research counterpart, in a peer-reviewed international journal.