Tohoku University

International Joint Graduate Program in Resilience and Safety Studies

1. **Masters (MC) Curriculum** 博士前期課程・修士課程
2. **Core Foundation Subjects** 基幹基礎科目

2021 Academic Year

(updated 2021.03.10)

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| **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. | | | |

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

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| **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 (Medicine) | 2 |
| **Date/time and venue:** Fridays 16:20-17:50 (April 16, 2021 – July 29, 2021)  Online lectures via Google Classroom and Zoom | | | |
| Lecturers: Shinichi Egawa, Hitoshi Oshitani, Eiichi Kodama, Takaaki Akaike, Taro Kamigaki  External Lecturers: Tomohiko Sugishita in Tokyo Women’s Medical University  Aya Goto in Fukushima Medical University  Sae Ochi in Jikei University School of Medicine   1. Class subject:   Human Security and Global Health   1. Aim and outline:   In order 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, role of health cluster and discuss on the problem solution.   1. The attainment target:   The participants will be able to;   * Describe the concept, history and related international frameworks of human security. * Explain and use the common terminology of human security and global health. * Find the problems that threaten health and human security, and plan the research projects for solution. * Describe the current situation and gaps of infectious disease, non-communicable disease, mother and child health, aging that global health is facing to. * Describe the cluster approach and the roles and coordination of clusters.  1. Course description and Class schedule:   Each class will be all 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. 16 (Fri): Introduction and guidance. General concept and the history of human security (Oshitani, Egawa) * Apr. 23 (Fri): Human security and global health governance 1 (Oshitani) * Apr. 30 (Fri): Human security and global health governance 2 (Oshitani) * May 7 (Fri): Sustainable Development Goals 1 (Egawa) * May 14 (Fri): Universal Health Coverage 1 (Egawa) * May 21 (Fri): Universal Health Coverage 2 (Egawa) * May 28 (Fri): COVID-19 Pandemic and Global Health Landscape (Sugishita, TWMU) * Jun. 4 (Fri): One Health. (Kamigaki) * Jun. 10 (Thu): Risk Communication in Global Health (Ochi, JikeiMU) (Schedule changed) * Jun. 18 (Fri): Environmental health and human security (Akaike) * Jun. 25 (Fri): Global situation of non-communicable disease (Egawa) * Jul. 3 (Fri): Working toward improving maternal and child health (Goto, FMU) * Jul. 9 (Fri): Sustainable Development Goals 2 (Egawa) * Jul. 16 (Fri): Infectious disease and human security (Kodama) * Jul. 30 (Fri): Nutrition and human security (Egawa)  1. Evaluation:   Attendance, Interactive mini post-test, Attitude in group work and/or debate.   1. Reference URL:  * World Health Organization (WHO): <http://www.who.int/en/> * World Health Statistics 2016   <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/>  (continued from previous page)   1. Learning Before and after classes:   The students are required to actively brush up of English and pre-, post-search of relevant information for discussion.   1. Others (publicity information for students, office hours, website, e-mail address):   Contact Prof. Shinichi Egawa at [egawas@surg.med.tohoku.ac.jp](mailto: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> | | | |

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| **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:** Wednesdays 17:15-18:45 (October 13, 2021 – February 2, 2022)  Online lectures via Google Classroom and Zoom | | | |
| Lecturers: Shinichi Egawa, Eiichi Kodama, Kiyoshi Ito, Koichi Chida, Susumu Fujii, Ken Osaka, Hiroaki Tomita, Masaharu Nakayama, Masatoshi Saito, Yoshio Hosoi  External Lecturer: Sae Ochi (Jikei Medical University)   1. Class subject:   Health and social resilience for large-scale disaster  *(Former: Disaster Medicine and Public Health Preparedness for Large-Scale Disaster)*   1. Aim and outline:   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.   1. The attainment target:   The participants will be able to;   * 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  1. Course description and Class schedule:   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. 13: Introduction, Great East Japan Earthquake (Egawa) * Oct. 20: Disasters in Asia (Egawa) * Oct. 27: Nuclear and radiological disaster and medical response (Hosoi) * Nov. 10: Sendai Framework for Disaster Risk Reduction (Egawa) * Nov. 17: Man-made disasters (Egawa) * Nov. 24: SPHERE Project and Psychological First Aid (Egawa)   + Dec. 1: Business Continuity Plan of the Hospital (Egawa)   + Dec. 8: Disaster and infectious disease. (Kodama)   + Dec. 15: Risk Communication in disaster (Ochi, JichiMU)   + Dec. 22: Disaster and mental health (Kunii)   + Jan. 5: Disaster and public health (Kuriyama)   + Jan. 12: Disaster and comprehensive health care (Osaka)   + Jan. 19: Maternal and child health in disaster (Saito)   + Jan. 26: Disaster and Medical Information (Fujii)   + Feb. 2: Prepared community HUG® (Egawa)   (continued from previous page)   1. Evaluation:   Attendance, Interactive mini post-test, Attitude in group work and/or debate.   1. Text and reference:   Handouts will be provided. Textbooks are not mandatory.   * Koenig and Schultz’s Disaster Medicine (2nd Edition) ISBN 978-1107040755 * Ciottone’s Disaster Medicine (2nd Edition) ISBN 978-0323286657 * DMAT textbook (in Japanese) ISBN 978-4892698590 * SPHERE handbook 2018, Sphere Project (Downloadable for free) * Sendai Framework for Disaster Risk Reduction (Downloadable for free)  1. Learning Before and after classes:  * The students are required to actively brush up of English and perform pre-, post-search of relevant information for discussion. * The students are supposed to participate the discussion actively regardless of their age, gender and ethnicity.  1. Others (publicity information for students, office hours, website, e-mail address):   Contact Prof. Shinichi Egawa at [egawas@surg.med.tohoku.ac.jp](mailto: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> | | | |

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| **Term** | **Title** | **Organizer** | **Credits** |
| Fall | Health Resilience in Aging Society  高齢化社会における健康レジリエンス | Professor Kenichi MEGURO  　(Medicine) | 2 |
| **Date/time and venue:** Mondays 17:15 - 18:45 November 8, 2021 - February 14, 2022  Seiryo Campus; Institute for Development, Aging, and Cancer, 1F | | | |
| **[Outline]**  To understand the basic concepts and the scope of issues on social support for the health of aging populations and health resilience, based on geriatric behavioral neurology.  Educational targets are:   * Basic concepts for behavioral neurology * Basic concepts for bio-psycho-social viewpoint and bioethics on the social support for elderly and health resilience * Social support system and Quality of Life for the handicapped and elderly and health resilience * Dementia and dementing diseases, not only for medical aspects, but also psycho-social and economic aspects and health resilience   **[Content]**   * Key concepts and actions related with Earthquake for the elderly, Local response following the Great East Japan Earthquake 2011〝The Get Ready Pyramid (Prof. Meguro) * Social problem and judgement, Judgement as a brain function (Prof. Meguro * Main causes of requiring care and cognitive impairments, Relationships between physical dysfunctions and cognitive impairments in elderly people (Dr. Kasai, Prof. Meguro) * End of life and decision making for elderly people, Decision making regarding treatment in the end of life care (Assistant Prof. Koto, Prof. Meguro) * Long‐Term Care Insurance system in Japan, Background and concept, Care services and institutional care (Assistant Prof. Takada, Prof. Meguro) * Dignity and quality of life/ Historical perspectives (Dr. Nakatsuka) * Rehabilitation, exercise and preventive intervention for elderly (Assistant Prof. Kumai, Prof. Meguro) * Mindfulness (Prof. Meguro) * Geriatric medical care and psychiatry (Prof. Meguro) * Adequate amount of nutrition for the healthy life, protein, calories (Prof. Meguro) * Summary (Prof. Meguro)   **[Evaluation]**  Attendance and class reports will be evaluated at the end of term. | | | |

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| **Term** | **Title** | **Organizer** | **Credits** |
| Spring | International Development Studies  国際開発学 | Professor Katsuhito FUYUKI  (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. The main objective of this subject 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, they must prepare a handout of their report based on their assigned chapter in the textbook and its related papers.  **[Content]**  Introduction, contents and progress schedule will be announced at the first class.  **[Evaluation]**  Presentation of textbook 50%, presentation of homework 30%, and discussion 20% | | | |

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| **Term** | **Title** | **Organizer** | **Credits** |
| Fall | Food Economics  食料経済学 | Associate 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]**  This course will examine problems concerning agricultural and food production and a variety of policy design from economic perspectives. Policy design for agricultural production and food security, structural change of food production and trends in food consumption, agricultural modernization and structural changes, policy issues on food safety and quality, agriculture and the environment are 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 problem of agriculture, food production and consumption in the countries of participants.  Students will come to understand current situation and problems on agriculture and food sector in different countries through comparative approach.  **[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]**  Assessment will be based on class attendance, presentations, in-class participation and a term paper. | | | |

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| **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 A07 / 川内キャンパス川北合同研究棟 (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. | | | |

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| **Term** | **Title** | **Organizer** | **Credits** |
| Spring | Energy and Resource Resilience Strategies  国際資源エネルギー戦略論 | Associate Prof. Guido GRAUSE  (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, 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 such as fossil fuels, nuclear, hydrogen, energy recovery from waste, and the recycling of metals, plastic and other valuable materials in addition to emerging technologies.  **[Contents]**  Week 1: Sustainability and planetary boundaries  Week 2: Footprints and resource depletion  Week 3: Fossil fuels  Week 4: Biotic resources and land use  Week 5: Biopolymers  Week 6: Abiotic resources  Week 7: Circular economy I  Week 8: Circular economy II  Week 9: Coal electricity in Japan I  Week 10: Coal electricity in Japan II  Week 11: Activity: Mapping out lock-in in energy and socio-technical systems  Week 12: Strategies to Diffuse Fuel Cell Vehicles in Japan  Week 13: Strategies to Diffuse Fuel Cell Vehicles in California  Week 14: Activity: Strategies to accelerate Fuel Cell Vehicle diffusion  Week 15: Final presentation  **[Evaluation]**  Attendance - 20%, Final presentation - 40%, Group research report - 40%. | | | |

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| **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; Graduate School of International Cultural Studies A08; 1F Lecture Hall109  川内キャンパス 国際文化研究科棟 (A08) 1F 109講義室 | | | |
| **[Outline]**  Nowadays we encounter global migration issues. What kind of issues they were/ are? In this class, students will understand (1) definition of global migration issues, (2) issues associated with global migration in history, (3) issues associated with global migration crisis, and (4) recent trends in integration policies of global migrants. Each student then chooses a case study for this subject which they will submit it as the term paper. Issues of global security associated with global migration issues are to be considered.  **[Content]**  Orientation  Discussion 1  Review of global migration issues  Global migration in history 1  Global migration in history 2  Global migration in history 3  Discussion 2  Global migration crisis: the crisis defined 1  Global migration crisis: the crisis defined 2  Global migration crisis: the crisis defined 3  Discussion 3  Recent trends in integration policies of global migrants 1  Recent trends in integration policies of global migrants 2  Recent trends in integration policies of global migrants 3  Review  **[Evaluation]**  Term paper (60%) and class participation (40%). Presentation and speech in discussion should be considered as class participation points. | | | |

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| **Term** | **Title** | **Organizer** | **Credits** |
| Spring | Environmental Resilience and Sustainability  環境レジリエンスと持続可能性 | Associate Prof. Kazuaki OKUBO  (International Cultural Studies) | 2 |
| **Date/time and venue:** Fridays 10:30-12:00  Kawauchi Campus; Graduate School of International Cultural Studies A08; 1F Lecture Hall 111  川内キャンパス 国際文化研究科棟 (A08) 1F 111講義室 | | | |
| **[Outline]**  We are facing various regional problems, such as environmental pollution and economic problem. Applying systematic analytical tools is useful for ensuring environmental resilience and achieving sustainable development. This course covers methodologies for analyzing environmental and economic problems to support the design of a sustainable development plan. Students will learn the basic techniques of mathematical programming and modeling. Application examples are drawn from regional development, environmental and resource management, and other elements.  **[Content]**   1. Orientation 2. Linear Programming (1)   3. Linear Programming (2)  4. Nonlinear Programming (1)  5. Nonlinear Programming (2)  6. Consumer Behavior (1)  7. Consumer Behavior (2)  8. Game Theory (1)  9. Game Theory (2)  10. Uncertainty  11. Producer Behavior  12. The Partial Equilibrium Competitive Model  13. General Equilibrium and Welfare  14. Market Failure  15. Final Examination  **[Evaluation]**  Requirements for grading (other than attending lectures) are submitting reports and giving presentations. | | | |

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| **Term** | **Title** | **Organizer** | **Credits** |
| Fall | Hydrology  水循環システム論 | Professor So KAZAMA  Associate Prof. Daisuke KOMORI  (Engineering) | 2 |
| **Date/time and venue:** Thursdays 14:40-16:10 Aobayama 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]**  Hydrology is the science dealing with the waters of the earth, their occurrence, circulation, distribution on the planet, their physical/chemical properties, and their interactions with the physical/biological environment including responses to human activity. Practical applications of hydrology are found in the design and operation of hydraulic structures, water supply, wastewater treatment and disposal, irrigation, drainage, hydropower generation, flood control, navigation, erosion control, sediment control, salinity control, pollution abatement, recreational use of water, and fish and wildlife protection. We narrowly define hydrology as the study of the hydrological cycle, that is, the endless circulation of water between the earth and its atmosphere.  This lecture series focuses on analyzing problems due to changes in the distribution, circulation, or temperature of the earth’s waters. We provide academic guidance on the planning and management of watershed environments. Finally, we will discuss topics on human security associated with watershed environments and water.  **[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: General water resources --  #05 Storage and dams  #06 Ecology and Water  #07 Watershed management  -- 3rd part: Social science aspect of water --  #08 Water Law (River Law in Japan) and water policy  #09 Watershed environment  #10 Virtual Water  #11 Water conflict  #12 World disasters and Human Security  -------------------------------------------  #13 Final Presentation  #14 Final Presentation  #15 Final Presentation  **[Evaluation]**  Based on assignments and presentations. | | | |

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| **Term** | **Title** | **Organizer** | **Credits** |
| Fall | Disaster Control System  防災システム論 | Professor Fumihiko IMAMURA Professor Shunichi KOSHIMURA Professor Ikuo ABE (Engineering) | 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. | | | |

1. **International Practicals** 国際実践科目

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| **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 Leadership Program (IELP) 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. | | | |

1. **Masters Practicum** MC研修科目

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| **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. | | | |

1. **Doctoral (DC) Curriculum** 医学履修課程・博士後期課程
2. **Core Development Subject** 基幹発展科目

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| **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. | | | |

1. **Transdisciplinary Development Subjects** 学際発展科目 (pages 18 – 30)

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| **Term** | **Title** | **Organizing Faculty** | **Credits** |
| Spring | Advanced Global Health  グローバルヘルス特論 | Professor Shinichi EGAWA (Medicine) | 2 |
| **Date/time and venue:** Fridays 16:20-17:50 (April 16, 2021 – July 29, 2021)  Online lectures via Google Classroom and Zoom | | | |
| Lecturers: Shinichi Egawa, Hitoshi Oshitani, Eiichi Kodama, Takaaki Akaike, Taro Kamigaki  External Lecturers: Tomohiko Sugishita in Tokyo Women’s Medical University  Aya Goto in Fukushima Medical University  Sae Ochi in Jikei University School of Medicine   1. Class subject:   Advanced Global Health   1. Aim and outline:   In order 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, role of health cluster and discuss on the problem solution. To plan a research agenda related to the human security and global health based on the topics provided.   1. The attainment target:   The participants will be able to;   * Describe the concept, history and related international frameworks of human security. * Explain and use the common terminology of human security and global health. * Find the problems that threaten health and human security, and plan the research projects for solution. * Describe the current situation and gaps of infectious disease, non-communicable disease, mother and child health, aging that global health is facing to. * Describe the cluster approach and the roles and coordination of clusters. * Identify the gaps and plan a scientific research agenda related with global health.  1. Course description and Class schedule:   Each class will be all 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. 16 (Fri): Introduction and guidance. General concept and the history of human security (Oshitani, Egawa) * Apr. 23 (Fri): Human security and global health governance 1 (Oshitani) * Apr. 30 (Fri): Human security and global health governance 2 (Oshitani) * May 7 (Fri): Sustainable Development Goals 1 (Egawa) * May 14 (Fri): Universal Health Coverage 1 (Egawa) * May 21 (Fri): Universal Health Coverage 2 (Egawa) * May 28 (Fri): COVID-19 Pandemic and Global Health Landscape (Sugishita, TWMU) * Jun. 4 (Fri): One Health. (Kamigaki) * Jun. 10 (Thu): Risk Communication in Global Health (Ochi, JikeiMU) (Schedule changed) * Jun. 18 (Fri): Environmental health and human security (Akaike) * Jun. 25 (Fri): Global situation of non-communicable disease (Egawa) * Jul. 3 (Fri): Working toward improving maternal and child health (Goto, FMU) * Jul. 9 (Fri): Sustainable Development Goals 2 (Egawa) * Jul. 16 (Fri): Infectious disease and human security (Kodama) * Jul. 30 (Fri): Nutrition and human security (Egawa)  1. Evaluation:   Attendance, Interactive mini post-test, Attitude in group work and/or debate.  Research agenda (End of the term)  (continued from previous page)   1. Reference URL:  * World Health Organization (WHO): <http://www.who.int/en/> * World Health Statistics 2016   <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/>   1. Learning Before and after classes:   The students are required to actively brush up of English and pre-, post-search of relevant information for discussion.   1. Others (publicity information for students, office hours, website, e-mail address):   Contact Prof. Shinichi Egawa at [egawas@surg.med.tohoku.ac.jp](mailto: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> | | | |

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| **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:** Wednesdays 17:15-18:45 (October 13, 2021 – February 2, 2022)  Online lectures via Google Classroom and Zoom | | | |
| Lecturers: Shinichi Egawa, Eiichi Kodama, Kiyoshi Ito, Koichi Chida, Susumu Fujii, Ken Osaka, Hiroaki Tomita,   Masaharu Nakayama, Masatoshi Saito, Yoshio Hosoi  External Lecturer: Sae Ochi (Jikei Medical University)   1. Class subject:   Health and social resilience for large-scale disaster  *(Former: Disaster Medicine and Public Health Preparedness for Large-Scale Disaster)*   1. Aim and outline:   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. To plan a research agenda related to the human security and disaster medicine based on the topics provided.   1. The attainment target:   The participants will be able to;   * 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   11. Identify the gaps and plan a scientific research agenda related with disaster medicine.  1. Course description and Class schedule:   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. 13: Introduction, Great East Japan Earthquake (Egawa) * Oct. 20: Disasters in Asia (Egawa) * Oct. 27: Nuclear and radiological disaster and medical response (Hosoi) * Nov. 10: Sendai Framework for Disaster Risk Reduction (Egawa) * Nov. 17: Man-made disasters (Egawa) * Nov. 24: SPHERE Project and Psychological First Aid (Egawa)   + Dec. 1: Business Continuity Plan of the Hospital (Egawa)   + Dec. 8: Disaster and infectious disease. (Kodama)   + Dec. 15: Risk Communication in disaster (Ochi, JichiMU)   + Dec. 22: Disaster and mental health (Kunii)   + Jan. 5: Disaster and public health (Kuriyama)   + Jan. 12: Disaster and comprehensive health care (Osaka)   (continued from previous page)   * + Jan. 19: Maternal and child health in disaster (Saito)   + Jan. 26: Disaster and Medical Information (Fujii)   + Feb. 2: Prepared community HUG® (Egawa)  1. Evaluation:   Attendance, Interactive mini post-test, Attitude in group work and/or debate.  Research agenda at the end of the term. The format for agenda will be provided at the Introduction.   1. Text and reference:   Handouts will be provided. Textbooks are not mandatory.   * Koenig and Schultz’s Disaster Medicine (2nd Edition) ISBN 978-1107040755 * Ciottone’s Disaster Medicine (2nd Edition) ISBN 978-0323286657 * DMAT textbook (in Japanese) ISBN 978-4892698590 * SPHERE handbook 2018, Sphere Project (Downloadable for free) * Sendai Framework for Disaster Risk Reduction (Downloadable for free)  1. Learning Before and after classes:  * The students are required to actively brush up of English and perform pre-, post-search of relevant information for discussion. * The students are supposed to participate the discussion actively regardless of their age, gender and ethnicity.  1. Others (publicity information for students, office hours, website, e-mail address):   Contact Prof. Shinichi Egawa at [egawas@surg.med.tohoku.ac.jp](mailto: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> | | | |

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| **Term** | **Title** | **Organizer** | **Credits** |
| Fall | Advanced Health Resilience in Aging Society  高齢化社会における健康レジリエンス特論 | Professor Kenichi MEGURO  　(Medicine) | 2 |
| **Date/time and venue:** Mondays 17:15 - 18:45 November 8, 2021 - February 14, 2022  Seiryo Campus; Institute for Development, Aging, and Cancer, 1F | | | |
| **[Outline]**  To understand the basic concept and scope of issues on social support for the health of aging population and health resilience, based on geriatric behavioral neurology.  To plan a research agenda related to the human security and aging based on the topics provided.  Educational targets:   * To understand the basic concept for behavioral neurology * To understand the basic concept for bio-psycho-social viewpoint and bioethics on the social support for elderly and health resilience * To understand the social support system and Quality of Life for the handicapped and elderly and health resilience * To understand the dementia and dementing diseases, not only for medical aspects, but also psycho-social and economic aspects and health resilience   **[Content]**   * Key concepts and actions related with Earthquake for the elderly, Local response following the Great East Japan Earthquake 2011〝The Get Ready Pyramid（Prof. Meguro） * Social problem and judgement, Judgement as a brain function（Prof. Meguro * Main causes of requiring care and cognitive impairments, Relationships between physical dysfunctions and cognitive impairments in elderly people (Dr. Kasai) (Prof. Meguro) * End of life and decision making for elderly people, Decision making regarding treatment in the end of life care (Assist. Prof. Koto, Prof. Meguro) * Long‐Term Care Insurance system in Japan, Background and concept, Care services and institutional care (Assist. Prof. Takada, Prof. Meguro) * Dignity and quality of life/ Historical perspectives (Dr. Nakatsuka) * Rehabilitation, exercise and preventive intervention for elderly (Assist. Prof . Kumai, Prof. Meguro) * Mindfulness (Prof. Meguro) * Geriatric medical care and psychiatry (Prof. Meguro) * Adequate amount of nutrition for the healthy life, protein, calories (Prof. Meguro) * Summary (Prof. Meguro)   **[Evaluation]**  Attendance, reports and research agenda: Evaluation will be done at the end of term. | | | |

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| **Term** | **Title** | **Organizing Faculty** | **Credits** |
| Spring | Advanced International Development Studies  応用国際開発学 | Professor Katsuhito FUYUKI  (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. The main objective of this subject 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, they must prepare a handout of their report based on their assigned chapter in the textbook and its related papers.  **[Content]**  Introduction, contents and progress schedule will be announced at the first class.  **[Evaluation]**  Presentation of textbook 50%, presentation of homework 30%, and discussion 20% | | | |

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| **Term** | **Title** | **Organizing Faculty** | **Credits** |
| Fall | Advanced Food Economics  応用食料経済学 | Associate 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]**  This course will examine problems concerning agricultural and food production and a variety of policy design from economic perspectives. Policy design for agricultural production and food security, structural change of food production and trends in food consumption, agricultural modernization and structural changes, policy issues on food safety and quality, agriculture and the environment are 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 problem of agriculture, food production and consumption in the countries of participants.  A term paper will be also required.  **[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]**  Assessment will be based on class attendance, presentations, in-class participation, and a term paper. | | | |

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| **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 A07 / 川内キャンパス川北合同研究棟 (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. | | | |

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| **Term** | **Title** | **Organizing Faculty** | **Credits** |
| Spring | Advanced Energy and Resource Resilience Strategies  国際資源エネルギー戦略論特論 | Associate Prof. Guido GRAUSE  (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 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 advanced class, doctoral students will integrate their research skills to identify and systematically evaluate the advantages and disadvantages of the development and consumption of energy and resources such as fossil fuels, nuclear, hydrogen, energy recovery from waste, and the recycling of metals, plastic and other valuable materials in addition to emerging technologies. Assessments will include an oral presentation and a research document.  **[Contents]**  Week 1: Sustainability and planetary boundaries  Week 2: Footprints and resource depletion  Week 3: Fossil fuels  Week 4: Biotic resources and land use  Week 5: Biopolymers  Week 6: Abiotic resources  Week 7: Circular economy I  Week 8: Circular economy II  Week 9: Coal electricity in Japan I  Week 10: Coal electricity in Japan II  Week 11: Activity: Mapping out lock-in in energy and socio-technical systems  Week 12: Strategies to Diffuse Fuel Cell Vehicles in Japan  Week 13: Strategies to Diffuse Fuel Cell Vehicles in California  Week 14: Activity: Strategies to accelerate Fuel Cell Vehicle diffusion  Week 15: Final presentation  **[Evaluation]**  Attendance - 20%, Final presentation - 40%, Group research report - 40% | | | |

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| **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; Graduate School of International Cultural Studies A08; 1F Lecture Hall109  川内キャンパス 国際文化研究科棟 (A08) 1F 109講義室 | | | |
| **[Outline]**  Nowadays we encounter global migration issues. What kind of issues they were/ are? In this class, students will understand (1) definition of global migration issues, (2) issues associated with global migration in history, (3) issues associated with global migration crisis, and (4) recent trends in integration policies of global migrants. Each student then chooses a case study for this subject which they will submit it as the term paper. Issues of global security associated with global migration issues are to be considered.  **[Content]**  Orientation  Discussion 1  Review of global migration issues  Global migration in history 1  Global migration in history 2  Global migration in history 3  Discussion 2  Global migration crisis: the crisis defined 1  Global migration crisis: the crisis defined 2  Global migration crisis: the crisis defined 3  Discussion 3  Recent trends in integration policies of global migrants 1  Recent trends in integration policies of global migrants 2  Recent trends in integration policies of global migrants 3  Review  **[Evaluation]**  Term paper (60%) and class participation (40%). Presentation and speech in discussion should be considered as class participation points. | | | |

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| **Term** | **Title** | **Organizing Faculty** | **Credits** |
| Spring | Advanced Environmental Resilience and Sustainability  環境レジリエンスと持続可能性特論 | Associate Prof. Kazuaki OKUBO  (International Cultural Studies) | 2 |
| **Date/time and venue:** Fridays 10:30-12:00  Kawauchi Campus; Graduate School of International Cultural Studies A08; 1F Lecture Hall 111  川内キャンパス 国際文化研究科棟 (A08) 1F 111講義室 | | | |
| **【Outline】**  This course covers advanced mathematical modeling methodologies to help students analyze and understand various regional issues related to environmental resilience and sustainable development. Students learn the techniques of mathematical modeling for planning, including microeconomics, convex optimization, and other approaches through examples from transportation systems, regional development, environmental and resource management, and other elements.  **[Content]**   1. Orientation 2. Linear Programming (1)   3. Linear Programming (2)  4. Nonlinear Programming (1)  5. Nonlinear Programming (2)  6. Consumer Behavior (1)  7. Consumer Behavior (2)  8. Game Theory (1)  9. Game Theory (2)  10. Uncertainty  11. Producer Behavior  12. The Partial Equilibrium Competitive Model  13. General Equilibrium and Welfare  14. Market Failure  15. Final Examination  **【Evaluation】**  Requirements for grading (other than attending lectures) are submitting reports and giving presentations. | | | |

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| **Term** | **Title** | **Organizing Faculty** | **Credits** |
| Fall | Advanced Hydrology  水循環システム論特論 | Associate Prof. Daisuke KOMORI  Professor So KAZAMA  (Engineering) | 2 |
| **Date/time and venue:** Thursdays 14:40-16:10 Aobayama 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]**  This course is for deepening your knowledge on water resources with some examples and requests some literature reviews, field surveys, lab experiments, building program codes and so forth for sensing hydrological processes. These practices are carried out with teachers in charge of this course selecting some problems relating with your dissertation as possible because water is highly related with disasters, environments, and human activities.  Grades are estimated by attendance, quizzes, and examinations (incl reports and essays). Hydrology requires daily experiences of water both in and outside the classroom. These experiences will be the preparation of this class and be helpful for understanding of hydrology and water resources.  **[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: General water resources --  #05 Storage and dams  #06 Ecology and Water  #07 Watershed management  -- 3rd part: Social science aspect of water --  #08 Water Law (River Law in Japan) and water policy  #09 Watershed environment  #10 Virtual Water  #11 Water conflict  #12 World disasters and Human Security  -------------------------------------------  #13 Final Presentation  #14 Final Presentation  #15 Final Presentation  **[Evaluation]**  Some assignments and presentation are evaluated. | | | |

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| **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 Professor Ikuo ABE (Engineering) | 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. | | | |

1. **Practicum** DC海外研修

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| **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. | | | |