東北大学

Tohoku University

文部科学省　博士課程教育リーディングプログラム　複合領域型（安全安心）

Program for Leading Graduate Schools, MEXT

Multidisciplinary Field of Safety and Security

グローバル安全学トップリーダー育成プログラム

Inter-Graduate School Doctoral Degree Program on Science for Global Safety

平成３１年度

Academic Year 2019

シラバス

Syllabus

Name of Lecture	Action-oriented Disaster Mitigation II
Schedule / Venue	Tuesday, 8:50-10:20 / International Research Institute of Disaster Science (4th floor / meeting room no. 3)
Category	Multidisciplinary Subject
Credit(s)	1
Course	All
Semester	Spring semester (4/9, 4/16, 4/23, 5/7, 5/14, 5/21, 5/28)
Instructor	Associate Prof. Anawat Suppasri , Associate Prof. Mas Erick

1. Name of Lecture	Action-oriented Disaster Mitigation II
2. Purpose / Abstract	This courses covers the history of water-related disasters (floods, typhoons, tsunamis), mechanisms of damage, damage countermeasures (structures, warning, evacuation), and reconstruction after disasters. Students will learn about and apply disaster forecasting and mitigation theory and models.
3. Goal	-To understand the difference between water-related disasters and other types of disasters (volcanic, seismic, geotechnical, etc). -To understand practical measures enacted for reducing vulnerability to water-related disasters. -To understand the causes and cycle of water-related disasters.
4. Contents	Week 1: Introduction to water-related disasters and countermeasures (Suppasri) Week 2: Modeling for disaster mitigation (Mas) Week 3: River floods (Suppasri) Week 4: Storm surge (Suppasri) Week 5: Tsunami (Suppasri) Week 6: Remote sensing (Mas) Week 7: Group design project presentations (Suppasri, Mas)
5. Grading	Design project 75% Attendance and participation 25%

6. Book required / referenced	
7. Remarks	Lectures will be held in English. Design project presentations will be made in English. Please bring your own laptop for use during the first and following classes.

Name of Lecture	Action-oriented Disaster Mitigation V
Schedule / Venue	Wednesday, 8:50-10:20 / Meeting room at IRIDeS (TBD)
Category	Multidisciplinary Subject
Credit(s)	1
Course	All
Semester	Spring semester: 4/10、17、24、5/8、15、22、29 (Backup: 6/5, 12, 19)
Instructor	Prof. Kenjiro Terada, Prof. Kohju Ikago, Associate Prof. Susumu Ohno, Associate Prof. Shuji Moriguchi

1. Name of Lecture	Action-oriented Disaster Mitigation V
2. Purpose / Abstract	Various issues on the Great East Japan Earthquake (GEJE) in engineering areas such as earthquake, geotechnical and structural engineering are discussed. Also, learned from the lessons of GEJE, the engineering and design concepts are to be studied for the resilient and sustainable infrastructures and buildings in urban areas. Moreover, the cutting edge of technologies in disaster science as well as the practices and problems for their social implementation are also come within the scope of this class.
3. Goal	To think for oneself the whole concept of engineering and design for resilient and sustainable infrastructures and buildings in urban areas, and to acquire the fundamental knowledge for practical activities of the action-oriented disaster mitigation.
4. Contents	1. Experiences and lessons of GEJE from earthquake engineering viewpoints 2. Experiences and lessons of GEJE from structural engineering viewpoints 3. Experiences and lessons of GEJE from geotechnical engineering viewpoints 4. Frontier of disaster-prevention research in geotechnical engineering

	5. Frontier of disaster-prevention research in structural engineering 6. Numerical simulations and visualizations in disaster science 7. Multi-disciplinarity in comprehensive disaster prevention
5. Grading	Attendance: 60% Report or examination: 40%
6. Book required / referenced	Net yet determined; follow instructions.
7. Remarks	

Name of Lecture	Action-oriented Disaster Mitigation VII (Inter-disciplinary: International policy on disaster risk reduction)
Schedule / Venue	Thursday, 16:20 – 17:50 / Room S302 at International Research Institute of Disaster Science
Category	Multidisciplinary Subject
Credit(s)	1
Course	All
Semester	Spring semester (4/11、18、25、5/9、16、23、30)
Instructor	Prof. Yuichi Ono, Associate Prof. Takako Izumi, Associate Prof. Kanako Iuchi, Assistant Prof. Daisuke Sasaki, Associate Prof. Yasuhito Jibiki

1. Name of Lecture	Action-oriented Disaster Mitigation VII
2. Purpose / Abstract	1. Taking consideration with variety of disaster types, such as earthquakes, volcanic eruptions, tsunami and floods, comprehending significance of international efforts on disaster (risk) reduction, practically understanding current situation and challenges, and developing students' capacity to become effective players immediately. 2. Understanding historical background on efforts of disaster (risk) reduction by the United Nations, including Yokohama Strategy of 1994, Hyogo Frame for Action (HFA) of 2005 and Sendai Framework for Disaster Risk Reduction of 2015.
3. Goal	1. Understanding the meanings and background of disaster (risk) reduction, taking consideration with variety of disaster types, such as earthquakes, volcanic eruptions, tsunami and floods. 2. Examining international organizations' efforts on disaster (risk) reduction along with concerns of each

	students, and delivering oral presentations in English about their efforts. 3. Making lists of activities related to disaster (risk) reduction by major international organizations, and having oral presentations about these activities in English.
4. Contents	* The class contents will not change drastically, but the class schedule can revise. #1. Guidance #2. Perspectives and concepts to explore the Sendai Framework for Disaster Risk Reduction. #3. Planning and Disaster Risk Management in International Development. #4. International Disaster Response Mechanism in the context of disaster risk reduction. #5. Statistical analysis of the international disaster risk reduction. #6. Current situations and challenges of policies in international disaster (risk) reduction by the United Nations #7. Oral presentations by students and discussions
5. Grading	Students will be comprehensively graded by both output quality and active involvements in the class.
6. Book required / referenced	None.
7. Remarks	The lectures will be held in Japanese and English. The detailed schedule and venue of the lecture can be changed, based on consultations by the registered students and the instructors.

Name of Lecture	Lecture for Leadership
Schedule / Venue	Friday, 16:20-17:50 / Engineering Laboratory Complex Building, 3rd floor Room #306
Category	Multidisciplinary Subject
Credit(s)	1
Course	All
Semester	Spring semester (4/12, 19, 26, 5/10, 24, 31, 6/7)
Instructor	Prof. Hiroo Yugami, Prof. Fumihiko Imamura, Prof. Yoshimichi Sato, Prof. Michihiko Nakamura and invited lecturers

1. Name of Lecture	Lecture for Leadership
2. Purpose / Abstract	The proposition “What is leadership” will be discussed in various aspects. The leaders who had coped with actual disasters will be invited. The students will learn practical crisis responses from their experiences.
3. Goal	The "qualities" of a global leader will be discussed to understand how to foresight the future, persuade people and lead subordinates. Practical examples of dealing with media, advising municipalities and disseminating information to society will be introduced.
4. Contents	Lectures will be given on the “leaderships” in scenes with backgrounds of engineering, natural science, and social sciences and humanities by several professors in an omnibus form.
5. Grading	Attendance, discussion in the class and reports
6. Book required / referenced	
7. Remarks	

科目名	Top Leader's Special Lecture II トップリーダー特別講義 II
曜日・教室	To be announced
科目群	Multidisciplinary Subject
単位数	1
対象コース	All
開講学期	Spring / Fall
担当教員	工学教育院担当教員

１．授業科目	Top Leader's Special Lecture II
２．授業の目的と概要	地球規模の課題（環境、エネルギー、物質資源、安全等）へ取り組むことによる持続可能社会の実現と少子高齢化の下での真に豊かな成熟社会の創造を目指す人材となるために、現在世界で活躍するトップリーダー達から学ぶ。
３．学習の到達目標	この授業では主に以下のような能力を修得することを目標とする。 ・世界が直面する課題や情勢を俯瞰・理解する。 ・強い問題意識、広い視野、長期展望を涵養する。 ・国の礎としてこれからの日本を支え、世界のトップリーダーになるという気概と意欲を持てる。
４．授業内容・方法と進度予定	この授業は、各方面で現在トップリーダーとして活躍し実績をあげた講師陣から、大学から社会に巣立つ多くの学生にむけ、世界のトップリーダーになるという気概を持つ大切さ、実現するために必要なものは何か、真に豊かな社会とは何か、等様々な視点に基づいた講義を行う。専門にとらわれず学部および大学院生としての知識を広げる講義内容である。 月曜日４講時（14:40～16:10）に以下のとおり開講する。 第１回：4 月 22 日（月）「工学研究者としての研究・起業体験とデジタル変革の展望」藤原　洋（株式会社ブロードバンドタワー 代表取締役会長兼社長 ＣＥＯ，株式会社インターネット総合研究所 代表取締役） 第 2 回：5 月 13 日（月）「世界の地政学的構造変化」 岡本　行夫（外交評論家，東北大学特任教授（客員）） 第 3 回：5 月 20 日（月）「一番大事と思うことをやる - 生命誌研究館の 25 年 -」中村　桂子（生命誌研究者，ＪＴ生命誌研究館館長）

	第 4 回：6 月 3 日（月）「国土交通省における技術政策について」菊地　身智雄（国土交通省技監，工学研究科修了） 第 5 回：７月４日（木）「科学技術と社会」元村　有希子（ジャーナリスト，毎日新聞社 科学環境部長） 第 6 回：10 月 21 日（月）「未定」御厨　貴（政治学者） 第 7 回：11 月 18 日（月）　「未定」 三菱ふそうトラック・バス株式会社 経営層
５．成績評価方法	・講義開始時に、出席票を兼ねる小レポートの用紙を配布するので、後日提出すること。 ・レポート提出率（提出回数/講義回数）)×(レポートの内容による素点の平均)＝評価点とする。
６．教科書および参考書	講義のなかで適宜紹介する。
７．その他	
８．備考	

Name of Lecture	Advanced Disaster Mitigation I, II
Schedule / Venue	
Category	Multidisciplinary Subject
Credit(s)	1 (each)
Course	All
Semester	
Instructor	

1. Name of Lecture	Advanced Disaster Mitigation I, II
2. Purpose / Abstract	The purpose of this course is to learn practical knowledge on solving problems with various kinds of disaster.
3. Goal	Acquisition of practical knowledge on disasters and their mitigation.
4. Contents	Untaken Action-oriented Disaster Mitigation I-VIII will be assigned. The 3-5 year students are expected to understand the contents more interdisciplinarily and to participate in the classes making more questions and comprehensive discussion.
5. Grading	
6. Book required / referenced	Will be announced by the instructor of each class.
7. Remarks	

j Name of Lecture	Special Lecture on Earth and Planetary Dynamics
Schedule / Venue	
Category	Multidisciplinary Subject
Credit(s)	2
Course	All
Semester	
Instructor	Visiting Prof. Shunichiro Karato and other lecturers

1. Name of Lecture	Special Lecture on Earth and Planetary Dynamics
2. Purpose / Abstract	To learn various approaches to Earth and planetary dynamic including volcanic eruptions and crustal movements.
3. Goal	To understand backgrounds and basic theories of frontier studies on Earth and planetary dynamics based on observations, theories and experiments.
4. Contents	Elect courses corresponding 2 units. Note that abstract and schedule of each course will be provided separately.
5. Grading	Lecturers will explain evaluation methods (report submission.
6. Book required / referenced	Text book and references will be introduced in the courses.
7. Remarks	Contact : Prof. Michihiko Nakamura (Department of Earth Science), Assoc. Prof. Hironobu Iwabuchi (Department of Geophysics)

Name of Lecture	Disaster Control Engineering
Schedule / Venue	TBD
Category	Multidisciplinary Subject
Credit(s)	2
Course	All
Semester	Intensive Course
Instructor	Prof. Fumihiko Imamura, Assoc. Prof. Mas Erick, Prof. Osamu Nishimura, Prof. Yu-You Li, Prof. Hitoshi Tanaka, Assoc. Prof. Makoto Umeda

1. Name of Lecture	Disaster Control Engineering
2. Purpose / Abstract	The damage and impacts caused by the 2011 Tohoku earthquake disaster are revisited. The issues on reconstruction processes in the affected areas are discussed for the future disaster mitigation.
3. Goal	Understanding the mechanism of natural disaster, definition of disaster management and mitigation technology, to discuss the issues on the problem in application at the present and in the future through the experiences of the 2011 Tohoku earthquake.
4. Contents	What is the 2011 Tohoku earthquake and its disaster? Earthquakes and tsunamis in Tohoku Damages due to the earthquakes and tsunamis in the 2011 Tohoku event Recovery and reconstruction from the 2011 event Issues for reconstruction
5. Grading	Assignment and reports
6. Book required / referenced	東日本大震災を分析する I,II，明石書店
7. Remarks	

Name of Lecture	Advanced Safety Engineering of Nuclear Systems
Schedule / Venue	To be announced
Category	Multidisciplinary Subject
Credit(s)	2
Course	All
Semester	Intensive course
Instructor	Prof. Yutaka Watanabe, Prof. Yuichi Niibori, Prof. Makoto Takahashi, Specially Appointed Prof. Takayuki Aoki

1. Name of Lecture	Advanced Safety Engineering of Nuclear Systems
2. Purpose / Abstract	The Fukushima Daiichi accident, happened in March, 2011, initiated and has continued hot discussions from the various viewpoints of utilization of nuclear energy. Most important and essential thing is “ensuring highest nuclear safety” in the field of nuclear safety. The role of nuclear energy that play for long term and stable energy supply is still important from the viewpoint of energy security, greenhouse gas reduction and economy in Japan. So we need continued efforts to enhance long-term reliability and safety of nuclear power plants (NPPs) if we continue to use them. Tohoku University established a vision of taking a lead for the Fukushima restoration and newborn and has been working on the activities for contribution to the decommissioning of Fukushima Daiichi as one of the most important tasks in the vision. An implementation of the nuclear decommissioning requires deep understanding of many things including the current status of Fukushima Daiichi, experiences of core damage accidents in the past, and technologies to be applied. The lectures of academic foundations on the followings will be made in this intensive course. + Current status of Fukushima Daiichi NPPs + Lessons learned from the core damage accidents in the past + Current status and issues of the researches for nuclear decommissioning + R&D activities for nuclear decommissioning + Approach to integrity evaluation of damaged facilities during nuclear decommissioning + Basics of nuclear fuel debris + Processing, treatment and disposal of nuclear fuel debris + Risk communications + Others The lecturers are from Tohoku University, Tepco., IRID,

	JAEA, Hitachi GE nuclear energy, Toshiba, MHI, Kajima etc.
3. Goal	The goal is to cultivate abilities and skills in graduate students so that they can acquire basic knowledge and analytical capabilities which are commonly needed by experts including electric utilities, plant vendors, researchers, personnel in regulatory body who are engaged in nuclear safety related matters.
4. Contents	1. Risk concept and basics of risk evaluation and management 2. Ideas and approaches on safety and facility management in nuclear power plants 3. History and the new regulatory requirements for countermeasures against severe accident in Japan 4. Current status on nuclear decommissioning in Japan and points of the important measures for it 5. Current status of JAPC implementation efforts for the decommissioning in Tokai gas cooled nuclear plant site 6. Lessons learned from TMI and Chernobyl and some of them applicable to Fukushima 7. Current status and perspectives of Fukushima Daiichi nuclear power plants 8. Technical strategic plan for the decommissioning of Fukushima Daiichi nuclear power plants 9. Current status of the decommissioning of Fukushima Daiichi and research tasks needed for it 10. Importance of evaluation of time-related deterioration phenomena in structural integrity management during nuclear decommissioning and its approach 11. Ideas and approaches on long-term integrity evaluation of damaged concrete structures 12. Roles of remote technologies in the decommissioning of nuclear power plants and applicable technologies 13. Development of robots for the nuclear decommissioning and examples of the applications 14. Solid-state chemistry of nuclear fuel and basics of nuclear fuel debris 15. Characterization and treatment of nuclear fuel debris 16. Radioactive waste management (Some of the above may be changed without notification.)
5. Grading	Grading is made based on reports to be submitted and performances in discussions
6. Book required / referenced	Some materials are distributed during lectures.
7. Remarks	

Name of Lecture	Industrial Engineering
Schedule / Venue	5/11(Sat.) • 5/18(Sat.) • 5/25(Sat) 9:00～17:00 Room # 305 Engineering Laboratory Complex Building
Category	Multidisciplinary Subject
Credit(s)	2
Course	All
Semester	Spring Semester
Instructor	Associate Prof. Rihito Kuroda

1. Name of Lecture	Industrial Engineering
2. Purpose / Abstract	
3. Goal	
4. Contents	Basic mission of production is a cost-effective and speedy manufacturing and sales of non-defective products, as well as to achieve a wide-variety small-volume manufacturing that is as efficient as a large-volume manufacturing. This lecture is about the industrial engineering and its management with various aspects to achieve such basic mission of production. History of industrial engineering, case study of actual industries, basic of manufacturing process and ideal manufacturing system will be covered and discussed. The purpose of this lecture is to support students those who may take on the role at future production scenes to learn basic knowledge of industrial engineering with various aspects and to deepen their consideration of manufacturing system and its further development for a construction of total optimized manufacturing system with positive economic effects.
5. Grading	
6. Book required / referenced	
7. Remarks	

Name of Lecture	Project Management
Schedule / Venue	4/11～6/13 every Wednesday　10:30-12:00, 6/15(Fri)・6/22(Fri)　13:00-14:30, 6/29(Fri.)　8:50-10:20 Room # 817 Engineering Laboratory Complex Building
Category	Multidisciplinary Subject
Credit(s)	2
Course	All
Semester	Intensive Course in 1st Semester
Instructor	Prof.Makoto Takahashi et al.

1. Name of Lecture	Project Management
2. Purpose / Abstract	The lecture of project management deals with the planning, execution, and controlling of projects based on the PDCA cycle as planning (Plan), execution (Do), check (Check) and correction (Action).
3. Goal	The goal is to understand the technique of the systematic project management, and the knowledge to raise an outcome of a project and the practice ability.
4. Contents	This lecture is focused on the management and implementation of the following topics: building a project organization and operation, establishment of WBS（Work Breakdown Structure）, securement of human and material resources, estimate of a cost, job allocation to a team member, progress management, operational directionality maintenance, cost benefit analysis, project control, project management engineering, and project evaluation.
5. Grading	written examination
6. Book required / referenced	A Guide to the Project Management Body of Knowledge (PMBOK Guide) Fifth Ed.
7. Remarks	

Name of Lecture	R&D Management
Schedule / Venue	Intensive course (from Aug. 1, 2019 to Aug. 3, 2019)
Category	Multidisciplinary Subject
Credit(s)	2
Course	All
Semester	Spring-summer semester
Instructor	Prof. Hideo Miura, Prof. Yutaka Watanabe and visiting professors

1. Name of Lecture	R&D Management
2. Purpose / Abstract	The important skills for the effective and rational management of research and development in scientific and technological fields are lectured. Most important issue is how to propose a new R&D project for the human societies near future. Not only the personal skills but also the trend of the science and technology policies all over the world will be discussed. Group discussion for proposing a new R&D project is the most important part of this intensive course for training the management skill of each student.
3. Goal	Students are expected to learn the basic important way of thinking for the management of research and development project from the viewpoints of top leader, middle manager, and personal researcher. The most important issue is to be aware of indispensable skills which each student should improve during her/his student life to be a leader of a certain research project near future.
4. Contents (provisional)	1) Introduction 2) Basic concept of project management 3) Top and middle management 4) Personal management 5) R&D management in universities and industries 6) Trend of science and technology policy in Japan and other advanced countries 7) Consulting session (Q&A on lectures) 7-A: Viewpoint of a project manager

	7-B: Viewpoint of a personal researcher/engineer 8) Group discussion for proposing a new project 9) Presentation and mutual evaluation 10) Summary
5. Grading	Summation of the results of the mutual evaluation of the presentation among students and personal written reports on the assigned issues concerning about lectures
6. Book required / referenced	Reference materials are introduced in each lecture.
7. Remarks	This intensive course consists of 3 days. Group discussion often continues to midnight of the second day. Students are expected to attend the three-straight-day course fully.

Name of Lecture	Introduction to Economics of Innovation and Entrepreneurship B
Schedule / Venue	10/5(Sat.)・10/12(Sat.)・10/26(Sat.)　10:30-16:10 Room # 817 Engineering Laboratory Complex Building
Category	Multidisciplinary Subject
Credit(s)	2
Course	All
Semester	2
Instructor	Associate Prof. Nobuya Fukugawa

1. Name of Lecture	Introduction to Economics of Innovation and Entrepreneurship B
2. Purpose / Abstract	1. Goal Students will be able to understand the significance and determinants of innovation and entrepreneurship from both theoretical and historical perspectives. 2. Pedagogy To help students obtain an understanding of a specific topic, economic concepts are related to a real world by anecdotal and statistical evidences taken from various regions, industries, and firms. To help students grasp a whole picture, concept maps are used to visualize the relationships among economic concepts.
3. Goal	See above.
4. Contents	1. theoretical part which introduces economic framework to understand the significance of innovation and entrepreneurship in the knowledge-based economy 2. historical part which comprises my lecture on the emergence of key industries and students' presentations on a specific industry based on reading assignment

5. Grading	Attendance and the quality of presentation
6. Book required / referenced	None. See below.
7. Remarks	Students are advised to download a handout which will be uploaded on my website (https://sites.google.com/site/nfukugawa/) before the course starts so as to confirm the aim and contents of the course.

Name of Lecture	Economics of Entrepreneurship
Schedule / Venue	11/2(Sat.) ~11/4(Mon) 10:30-16:10 Room # 817 Engineering Laboratory Complex Building
Category	Multidisciplinary Subject
Credit(s)	2
Course	All
Semester	Intensive course
Instructor	Associate Prof. Nobuya Fukugawa

1. Name of Lecture	Economics of Entrepreneurship
2. Purpose / Abstract	1. Goal Students will be able to understand the significance and determinants of entrepreneurship and the role of the government to promote entrepreneurial activities from the viewpoint of economic theory. 2. Pedagogical method To help students obtain an understanding of a specific topic, economic concepts are related to a real world by anecdotal and statistical evidences taken from various regions, industries, and firms. To help students grasp a whole picture, concept maps are used to visualize the relationships among economic concepts.
3. Goal	See above.
4. Contents	1. Why innovation and entrepreneurship? 2. Definition of entrepreneurship 3. Determinants of entrepreneurship 4. Entrepreneurship policy
5. Grading	TBA
6. Book required / referenced	None. See below.

7. Remarks	Students are advised to download a handout which will be uploaded on my website (https://sites.google.com/site/nfukugawa/) before the course starts so as to confirm the aim and contents of the course.

Name of Lecture	Bioethics and Environmental Ethics
Schedule / Venue	Tuesday, 13:00 -14:30 / Arts and Letters Building R919
Category	Multidisciplinary Subject
Credit(s)	2
Course	Human Science
Semester	Spring semester
Instructor	Prof. Kiyotaka Naoe

1. Name of Lecture	Bioethics and Environmental Ethics
2. Purpose / Abstract	Promoting the understanding of ethical issues in medicine, technology and environment. Developing a cross-cultural understanding of bioethical, environmental ethical issues.
3. Goal	Students are expected to show a good understanding of the ethical issues in medicine and environment. They should also develop critical thinking skills and cultural understanding in the field of medicine, environment and technology.
4. Contents	How to understand the concept of dignity has become an increasingly important in many fields: medicine, environmentology, robotics and so on. This course provides an overview of the history of the concept of dignity, and its availability in concrete cases. This course is centered on a lecture and a questions and answers session. The contents and schedule are as shown below: 1. Introduction: What is dignity? 2. Dignity in bioethics 3. Dignity: the first and the second person's perspective 4. Dignity of human embryo 5. Autonomy in terminal care (1) 6. Autonomy in terminal care (2) 7. Death with dignity and comfortable death (1)

	8. Death with dignity and comfortable death (2) 9. Dignity of disability person 10. Values of nature 11. Values of environment. 12. Robot and human dignity 13. Dignity of robots 14. Review (1) 15. Review (2) (The contents and the schedule are subject to update depending on circumstances.)
5. Grading	Participation in classroom discussions 20% Writing reports of lectures 80%
6. Book required / referenced	Yasushi, Kato (ed.), Dynamism in the Concept of Dignity, 2017 (in Japanese) Siep, Ludwig et.al., Bio-und Umwelt Ethik in Deutschland, 2001 (in Japanese translation) Human Dignity and Bioethics: Essays Commissioned by the President's council on Bioethics, 2008
7. Remarks	

Name of Lecture	Sociology of Risk and Disaster Reduction
Schedule / Venue	Monday, 16:20-17:50 / Arts and Letters Building R431
Category	Multidisciplinary Subject
Credit(s)	2
Course	All
Semester	Fall semester
Instructor	Prof. Yoshimichi Sato

1. Name of Lecture	Sociology of Risk and Disaster Reduction
2. Purpose / Abstract	We learn to apply sociological theories and methodology to mitigate the risks caused by natural disasters.
3. Goal	We need the perspective of social sciences as well as those of natural sciences and engineering to mitigate the risks of natural disasters. This course examines how to reduce the risks and prevent disasters with the help of sociological theories and methodology.
4. Contents	This course covers the following topics: 1) Reexamination of the philosophy of preventing disasters. 2) Social capital and disaster recovery 3) Firefighting organizations 4) Community 5) Volunteers
5. Grading	Term paper (60%) and attendance (40%)
6. Book required / referenced	Textbooks 1) Naoki Yoshihara (ed.), 2008, Sociology of Preventing Disaster, 2nd edition, Toshin-do. 2) Daniel P. Aldrich, 2012, *Building Resilience: Social Capital in Post-Disaster Recovery*, University of Chicago Press.
7. Remarks	Office hour: Wednesday, 4:20-5:50 pm (Need to make an appointment beforehand.)

Name of Lecture	Science and Society
Schedule / Venue	Intensive Course (13:00~18:00, Friday, May 31st and 9:30~12:30, Saturday, June 1st) Venue: Room A205, Science Complex A Building, Graduate School of Science
Category	Multidisciplinary Subject
Credit(s)	1
Course	All
Semester	Spring semester
Instructor	Associate Prof. Tsuyoshi Hondou

1. Name of Lecture	Science and Society
2. Purpose / Abstract	What is scientific proof? What is scientific correctness? Understanding of incertitude about those questions is basis for constructive discussion between science and society. We will discuss how these issues are related to the issues between science and society.
3. Goal	Understanding of incertitude of “scientific proof” and “scientific correctness”, as basis for constructive discussion with society. Understanding of condition needed for integrity of scientific research and for proper institutional design of science.
4. Contents	Lecture and workshop style. Variety of scientific incertitude will emerge by the workshop. Participants are requested to submit reports after the intensive course. Language of this class is in Japanese, but the report written in English or French is also available.
5. Grading	Participation (50%), Report (50%)
6. Book required / referenced	・Andy Stirling：“Keep it complex”， Nature, **468** 1029 (2010) ・Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals (Updated Dec. 2017) , International Committee of Medical Journal Editors (ICMJE)
7. Remarks	This class will be provided also for students at the Graduate School of Science.

	If schedule of this class partially overlaps with that of other class, students are allowed to attend this class partially. For detail, contact with an instructor in advance.

Name of Lecture	Science Communication
Schedule / Venue	Intensive Course (Aug 8th PM ～ Aug 9th: subject to change. Any change to the schedule will be announced to registrants.) Venue to be announced
Category	Multidisciplinary Subject
Credit(s)	1
Course	All
Semester	Spring semester
Instructor	Guest Lecturer: Tatsuhiro KAMISATO (Professor, Chiba University ; Guest editorial in the Asahi Shimbun) Associate Prof. Tsuyoshi HONDOU

1. Name of Lecture	Science Communication
2. Purpose / Abstract	Theme "Risk and communication" In recent years, how we face risks is one of the most important social issues. In particular, the issue of risk associated with science and technology is drawing attention in various fields such as environment, health, and energy. However, the concept of risk is, in fact, very modern Western and not necessarily familiar in Japanese society. Also, we need to consider various points of discussion, such as expertise and media, when we think about risk communication. Therefore, in this lecture, focusing on the issues of risk related to science and technology, we will consider the themes such as what is risk, the idea of risk society, and the relationship between media and risk. Furthermore, we will deepen our understanding through some cases, such as recent food issues.
3. Goal	・To learn the core of the difficulty of communication on risk related to science and technology and understand the way of thinking and specific measures for coping them. ・To deepen your understanding of cases such as food issues

	that actually occurred.
4. Contents	Intensive course in Japanese language: report in Engli sh is acceptable) Schedule to be announced.
5. Grading	Participation (50%), Report (50%)
6. Book required / referenced	To be announced at the class
7. Remarks	This class will be provided also for students at the Graduate School of Science. If schedule of this class partially overlaps with that of other class, students are allowed to attend this class partially. For detail, contact with an instructor in advance.

Name of Lecture	Advanced Theory and Practice of Risk Assessment and Management
Schedule / Venue	8/21(Wed.)・8/22(Thu.)・8/23(Fri.)　8:50-16:10 Room # 101 Engineering Laboratory Complex Building
Category	Multidisciplinary Subject
Credit(s)	2
Course	All
Semester	
Instructor	Prof.　Makoto Takahashi, Associate Prof.　Daisuke Karikawa

1.　Name of Lecture	Advanced Theory and Practice of Risk Assessment and Management
2.　Purpose / Abstract	In this lecture, the issues of safety after the Fukushima Daiichi nuclear power station accident will be discussed from variety of view points. The topic of aviation safety as well as nuclear safety will be given from the view point of engineering and research ethics. Risk communication is also discussed as one of the important topic related to the social acceptance of risk in modern society. Specific feature of this lecture is that the lecture by one of the key persons actually experienced the Fukushima Daiichi nuclear power station accident will be given, in which realistic story of the accident will be presented.
3.　Goal	To obtain knowledge and skills concerning advanced theory and practice of risk assessment and management
4.　Contents	Day 1(22, Aug,2018) ・Guidance ・Risk related to nuclear system ・Risk management in aviation industry ・Resilience Engineering and Fukushima Daiichi nuclear power station accident Day 2: (23, Aug,2018) ・Science and engineering communication after Fukushima

	Daiichi nuclear power station accident ・Nuclear technology and resilience engineering Day3: (24, Aug,2018) ・True story of Fukushima Daiichi nuclear power station accident ・Risk and ethics of science and technology ・Risk and legal system ・Summary
5. Grading	Evaluated based on the report on each topic
6. Book required / referenced	
7. Remarks	

Name of Lecture	Advanced Technology Management Seminar
Schedule / Venue	Tuesday : Engineering Laboratory Complex Building, Room 110 (Spring semester), 101 (Fall semester) Friday and Saturday : Off-site training
Category	Training Subject (Global Leader Training)
Credit(s)	2
Course	All
Semester	Spring semester (5/14, 21, 24, 25, 6/4, 11, 18, 25, 7/2) Fall semester (10/8, 15, 18, 19, 29, 11/5, 12, 19, 26) (Choose either Spring or Fall semester)
Instructor	Profs. S. Kudo, S. Kato, and R. Masuzawa

1. Name of Lecture	Advanced Technology Management Seminar
2. Purpose / Abstract	The lectures are for "Innovative Leaders Fostering Course". Details are shown on the website of ILP (Innovative Leaders Platform). Researchers are required to have quality such as the power of communication and project management as well as the research competency. This class provides lectures and trainings to extend the quality. We also provide lectures consisting of Interdisciplinary works in which students explore literature, argue a point, and present the results.
3. Goal	Understand the qualities and abilities required to live a full of self-confidence and fulfilling life as a doctor
4. Contents	8 lectures ・Strategic career design ・Understanding of people and the power of communication (Off-site training) ・Fundamental project management x 3 ・Interdisciplinary work (on trans-science) x 3
5. Grading	Need to attend 6 times or more (out of 8) including the off-site-training with reporting for 2 credits
6. Book required / referenced	The information will be provided at the class
7. Remarks	

Name of Lecture	Overseas Training
Schedule / Venue	
Category	Training Subject (Global Leader Training)
Credit(s)	2
Course	All
Semester	
Instructor	

1. Name of Lecture	Overseas Training
2. Purpose / Abstract	Overseas training in international organizations, global enterprises, and advanced research facilities and institutions for 2 weeks to 2 months.
3. Goal	The goal of this training is to acquire global visions, communication skills in multinational society and create a broad range of international personal connections.
4. Contents	The internship plan in the specified form should be submitted in advance to ask GS professors for advice.
5. Grading	Reports should be submitted within 1 month after finishing the internship.
6. Book required / referenced	
7. Remarks	

Name of Lecture	Super Internship
Schedule / Venue	
Category	Training Subject (Global Leader Training)
Credit(s)	2
Course	All
Semester	
Instructor	

1. Name of Lecture	Super Internship
2. Purpose / Abstract	Internship (practical training, laboratory researches, etc.) in the companies, corporates and administrative agencies.
3. Goal	To learn procedures and methods of plan making, investigation research, product development, manufacturing and quality control, and to experience human relations and atmosphere of the work sites.
4. Contents	A plan document in a given form should be submitted to and approved by the curriculum organizer beforehand. Within 1 month after the internship, a report (in a free form) should be submitted.
5. Grading	Grading is based on the report.
6. Book required / referenced	
7. Remarks	