Environmental Diplomatic Leader Education Program (EDL)
2011 Curriculum and Syllabus

Program Organizer
Master's Program in Environmental Sciences
Doctoral Program in Sustainable Environmental Studies
Graduate School of Life and Environmental Sciences
University of Tsukuba
**Requirement of Master’s Program in Environmental Sciences**

In order to graduate from the Master’s Program, student must complete 30 or more credits, including 18 credits of Compulsory Subjects in Fundamental Subjects and Internship studies I, II (2 credits in total), and pass the judgment of master’s thesis and final examinations.

**Compulsory Subjects (20 credits)**

- 01AD001 Introduction to Cycle-oriented Environmental Studies  
  1st Term: Mon.1 & 2 (8:40 – 11:25) (2 credits)
- 01AD002 Introduction to Environmental Symbiotic Studies  
  1st Term: Wed. 1 & 2 (8:40 – 11:30) (2 credits)
- 01AD003 Introduction to Environmental Ethics  
  1st Term: Fri. 1 & 2 (8:40 – 11:30) (2 credits)
- 01AD004 Field and Laboratory Works on Environmental Sciences  
  1st Term: Wed. (1 credit)
- 01AD011 (~012) Seminar in Environmental Sciences  
  Compulsory subject for 1st year student (2 credits)
- 01AD041 Internship Study in Environmental Studies I (1 credit)
- 01AD042 Internship Study in Environmental Studies II (1credit)
- 01AD021 (~025) Advanced Seminar in Environmental Sciences  
  Compulsory subject for 2nd year student (3 credits)
- 01AD031 (~035) Special Research in Environmental Sciences  
  Compulsory subject for 2nd year student (6 credits)

**Specialized Subjects (more than 10 credits)**

For more information on the course of Master’s Program in Environmental Sciences, please check [Syllabus](http://www.envr.tsukuba.ac.jp/eng/index.html) from the following website:

Requirement of Environmental Diplomatic Leader Program

For students who take the EDL Program, in addition to the Compulsory Subjects in Fundamental Subjects and Internship Studies I & II, following subjects are regarded as Compulsory Subjects:

- **01AD610** Cultural Ecology
  1\(^{st}\) Term: Monday 3 & 4 (2 credits)

- **01AD606** Introduction to International Health
  2\(^{nd}\) Term: Wednesday 5 & 6 (2 credits)

- **01AD601** Introduction to English Presentation and Debate
  2\(^{nd}\) Term: Monday 1 & 2 (2 credits)

- **01AD309** Introduction to Environmental Policy
  3\(^{rd}\) term: Monday 3 & 4 (2 credits)

- 2 subjects from the Special Lecture on Environmental Diplomatic Leader (I, II, III, IV) [01AD101, 01AD102, 01AD103, 01AD104]

- At least 4 subjects from the following three core fields (more than 1 subject from each core field)

  - **Water Resource field**
    - 01AD301 Introduction to Water Environment
    - 01AD302 Integrated Water Science and Technology

  - **Biodiversity field**
    - 01AD307 Utilization and Recycling of Bio-Resources
    - 01AD604 Biodiversity
    - 01AD607 Policy and Planning for Forest Conservation

  - **Public Health field**
    - 01AD605 Environmental Health Perspective

EDL Program also recommends students to take following subjects:

- 01AD310 Environmental Policy Appraisal
- 01AD611 Introduction to International Law
- 01AD612 Introduction to Sustainability Studies
- 01AD613 Introduction to Environmental Governance
Timetable

1st Term (Apr. 1 – Jul. 31)

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<tr>
<td>1</td>
<td>8:40 – 9:55</td>
<td>01AD001 Introduction to Cycle-oriented Environmental Studies</td>
<td>01AD002 Introduction to Environmental Symbiotic Studies</td>
<td>01AD003 Introduction to Environmental Ethics</td>
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<td>2</td>
<td>10:10 – 11:25</td>
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<td>3</td>
<td>12:15 – 13:30</td>
<td>01AD610 Cultural Ecology (Sun)</td>
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<td>01AD605 Environmental Health Perspective (Kumagai)</td>
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<td>4</td>
<td>13:45 – 15:00</td>
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<td>01AD004 Field and Laboratory Works on Environmental Sciences</td>
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In summer holiday
01AD041 Internship Study in Environmental Studies I (1 credit)
01AD042 Internship Study in Environmental Studies II (1 credit)

2nd Term (Aug. 1 – Nov. 30)

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<tr>
<td>1</td>
<td>8:40 – 9:55</td>
<td>01AD601 Introduction to English Presentation and Debate (Matsui &amp; Watanabe)</td>
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<td>01AD310 Environmental Policy Appraisal (Higano)</td>
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<td>10:10 – 11:25</td>
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<td>3</td>
<td>12:15 – 13:30</td>
<td>01AD302 Integrated water sciences and management (Fukushima)</td>
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<td>4</td>
<td>13:45 – 15:00</td>
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<td>01AD604 Biodiversity (Watanabe &amp; Aoki)</td>
<td>01AD606 Introduction to International Health (Wakasugi)</td>
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Special Lecture on Environmental Diplomatic Leader [III: 01AD103, IV: 01AD104] (one lecture per month)

Intensive course in 2nd term:
(1) 01AD611 Introduction to International Law
(2) 01AD613 Introduction to Environmental Governance

3rd Term (Dec. 1 – Mar. 31)

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<td>1</td>
<td>8:40 – 9:55</td>
<td>01AD307 Utilization and recycling of Bio-resources (Zhang &amp; Sugiuara)</td>
<td>01AD607 Policy and planning for Forest Conservation (Masuda)</td>
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<td>3</td>
<td>12:15 – 13:30</td>
<td>01AD309 Introduction to Environmental Policy (Endo)</td>
<td>01AD612 Introduction to Sustainability Studies (Kimura)</td>
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<td>15:15 – 16:30</td>
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<td>01AD301 Introduction to Water Environment (Tsujimura)</td>
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Special Lecture on Environmental Diplomatic Leader [III: 01AD103, IV: 01AD104] (one lecture per month)
Syllabus
01AD103  2nd-3rd Term
Special Lecture on Environmental Diplomatic Leader III
“Meet the leaders”
Teachers: Naomi Wakasugi, Maki Tsujimura, Takahiro Endoh, Xiaogang Sun
Arranged by Naomi Wakasugi

1. Outline
The objective of EDL (Environmental Diplomatic Leader Program) is to train and develop Environmental Leaders who will play an active role in order to clarify and resolve various global issues related to life and environment. The students are required to acquire sufficient knowledge and outcome of both natural and social sciences relevant to Environment. At the same time they are expected to grow up as a leader in future leading people and society to the change and to the innovation on the ground. Not a simple specialist in a narrow specialty but a person with multidisciplinary thinking and comprehensive activity in addition is strongly required.
For this purpose, these special lectures aim to meet and listen the actual leaders playing an important role in the area of Environment and Life. We invite five visiting lecturers as follows.

2. Plan of the lectures
1. Koichiro Matsuura (former Director-General of UNESCO)  
   Humankind and Civilization
2. Francois Dabis (Professor, Bordeaux University, Public Health)  
   HIV and AIDS in the world current state and future
3. Kiyoko Ikegami (Director, UNFPA Tokyo office)  
   Environment, Population and Women
4. Mitsuo Ichikawa (Professor, Center for African area studies, Kyoto University)  
   The conservation of tropical rainforest and Human environment
5. Shunji Matsuoka (Professor, graduate school of Asia-Pacific studies, Waseda University)  
   Effective Environmental Management in Developing Countries: Assessing Social Capacity Development

3. Remarks
Reports on the lectures and relevant issue are required.
1. Outline
This intensive lecture serves as an introduction to ethical theory as it applies to contemporary environmental issues facing science, industry, politics and individual decision-making. It provides a comprehensive philosophical survey of the field of environmental ethics, covering topics from the relevance of Aristotle's ethics for environmental issues to Deep Ecology and Ecofeminism.
Lecturer is Joseph DesJardins, professor of philosophy at the College of Saint Benedict and St. John’s University. He specializes in business ethics and environmental ethics and has published “Environmental Ethics” which has been widely read by students and people in United States as an introductory textbook for Environmental Ethics.
The field of environmental ethics has expanded during the past decade to account for the emergence of sustainable development as an alternative to market-based environmental policies. The language of “sustainable development,” “sustainability,” and the “triple bottom line” has gained many converts and supporters. This lecture will also explore sustainable development from an ethical and philosophical perspective.

2. Plan of the lectures
Part 1: A CONTEXT FOR ENVIRONMENTAL ETHICS
1. Philosophical Ethics and Environmental Public Policy / Morality and Social Ethics / Greek Ethics / Natural Law Ethics / Modern Social Ethics / Utilitarian Ethics / Deontological Ethics / Environmental Ethics
2. The Environment in Western Thought
Part 2: BASIC CONCEPTS OF ENVIRONMENTAL ETHICS
4. Economics and Environmental Policy
5. Aesthetic and Spiritual Values
6. Extensionism and Anthropocentrism
7. Holism: Ecology and Ethics
Part 3: POLICIES AND CONTROVERSIES IN ENVIRONMENTAL ETHICS
8. Pollution, Assessing Environmental Health Risks
9. Ethics and Animals
10. Ethics and Land
11. Wilderness Preservation
12. Growth and Development
13. Environmental Justice and obligations to future generations
14. International Relations and the Environment

Part 4: PHILOSOPHY AND THEORY OF ENVIRONMENTAL ETHICS
15. Deep Ecology, Social Ecology, and Ecofeminism
16. Political Theory, Social Justice and the Environment
17. Multicultural Perspectives on the Environment
18. Religious Perspectives
19. Environmental Pragmatism

Part 5: THE PHILOSOPHY AND ETHICS OF SUSTAINABLE DEVELOPMENT
Why sustainability matters; Development vs. Growth; The ethical pillar of sustainable development; Sustainable Living; Sustainable business

3. Suggested Readings

4. Remark
Attendance, report and participation in discussion
Cultural Ecology
1st Term: Monday 3 & 4 (12:15 – 15:00) (2 credits)
Teacher: SUN Xiaogang

1. Outline
Ecological anthropology (or cultural ecology) studies the interaction between human and natural environment through intensive fieldwork. It focuses not only on human use of nature and its feedback on human societies, but also on the meaning or value system by which human recognize nature surrounding them. The findings of the ecological anthropological study are significantly helpful in dealing with environmental problems, especially for revealing the reality of problems through fieldwork as well as building up a comprehensive understanding on human-nature relations through comparative studies. This course is intended to understand both the concepts and methodology of ecological anthropology, and its application to environmental issues. In the first half of the course, by reviewing detailed case studies on the subsistence of foragers, pastoralists and agriculturists in Africa, we will discuss the possibility of human-nature coexistence and the difficulties that indigenous people facing today. In the second half of the course, by reexamining some key concepts, such as resource management, production system, and development process from the anthropological perspective, we will discuss both the complexity of current environmental problems and the potential for future sustainable development.

2. Contents
1st week  Ecological anthropological approach to environmental problems; theory, methodology, and application.
2nd week  Human adaptations and social organizations in various environments
3rd week  Environment and culture I: Subsistence of foragers
4th week  Environment and culture II: Subsistence of pastoralists
5th week  Environment and culture III: Subsistence of agriculturalists
6th week  Environment and culture IV: Diversity of nature and culture in Africa
7th week  Resource management; communal use or privatization of resources
8th week  Production system; sustainability or productivity
9th week  Development process; “way of life” or modernization
10th week Sustainable development; integrating local knowledge with scientific technology
3. Suggested Readings

4. Remarks
Evaluation will be made based on the student’s attendance to the class, participation in the discussion, and final examination.
1. Outline
Environmental crisis and energy issue have caused us to question about what development and its direction are. It has been also observed a shift in paradigm from economic development to human development, which led people to reconsider the meaning and the value of health. Three out of eight targets of Millennium development goals concern health issues such as control of global infectious diseases including HIV/AIDS, Malaria and Tuberculosis and reduction of maternal and child death. This course aims to deepen your understanding and thinking about the situation of health of people worldwide which is closely related to global environment.

2. Contents
1st week Health of people worldwide
2nd week Development, environment and health
3rd week Human development and Human security
4th week Present and future of international cooperation for health in developing countries
5th week Infectious diseases (General basis, History, Control policy)
6th week Global infectious diseases (HIV/AIDS, Malaria, Tuberculosis)
7th week Population, Reproductive health and Gender
8th week Climate change and the impact on human health
9th week Management of health risk, Public health policy
10th week Summary and PCM (Project Cycle Management) workshop

3. Suggested Readings
Human Development Report (UNDP)
Protecting Health from Climate change (WHO)
International law and infectious diseases (D.P.Fidler)
And others be presented at the beginning

4. Remarks
Evaluation: Report (50%), Discussion and participation (50%)
01AD601   Introduction to English Presentation and Debate
2nd Term: Monday 1st-2nd periods (8:40~11:25) (2 credits)
Instructors: Kazuo Watanabe & Kenichi Matsui (Coordinator)
            Contact: Rikakei Building, Room# B305   Tel: 029-853-6701
            Email: kenichim(a)envr.tsukuba.ac.jp
            Web: www.envr.tsukuba.ac.jp/~envethic/homepage.html

1. Outline
This course aims to develop and refine your academic skills that are imperative in analyzing legal,
social, and ethical implications of environmental issues. You are asked to actively participate in
discussing, presenting, critically reading and writing about these issues so that you will be fully
prepared for your internationally competent career as an environmental scientist. Our discussion
topics include (1) environmental leadership; (2) eco-economy; (3) rights of nature; (4) climate
change; (5) LMOs and ELSI; (6) biological diversity and ecological service; (7) global bioethics; (8)
cultural diversity and indigenous knowledge; (9) theoretical approaches to environmental ethics.
The examination of these wide-ranging topics will not only enrich your knowledge about
environmental ethics but also enlarge your academic and public engagement capacity as an
environmental science communicator or leader.

2. Evaluation
Presentations (9)       45%
Cross-Examination (9)   28%
Moderation              27%
Participation           Extra 15%

3. Weekly schedule (subject to slight changes)
Week 1       Course Introduction (Matsui)
Week 2       Environmental Leadership (Matsui)
Week 3       Eco-Economy (Matsui)
Week 4       Rights of Nature (Matsui)
Week 5       Climate Change (Matsui)
Week 6       LMOs and ELSI (Watanabe)
Week 7       Global Bioethics (Matsui)
Week 8       Biodiversity and Ecological Service (Matsui)
Week 9       Cultural Diversity and Indigenous Knowledge (Matsui)
Week 10      Innovative Approaches to Environmentalism (Matsui)
1. Outline
It is difficult to solve environmental problems by an individual’s effort. Instead, organized actions are often required. Government and market are means of organizing people’s activities and can be effective tools for solving environmental problems. In this course, institutional responses to environmental problems will be discussed, with special reference to the roles of government and market.

2. Contents
1st week  Introduction: government and market
2nd week  Economic systems and property rights
3rd week  Functions of price mechanism
4th week  Public goods
5th week  Externalities and its remedy 1: Coase Theorem
6th week  Externalities and its remedy 2: Pigouvian tax and tradable permit
7th week  Common resource problem
8th week  Decentralization
9th week  Case study 1: groundwater management
10th week Case study 2: responses to drought

3. Suggested readings
References will be notified in each lecture, if necessary.

4. Remarks
Presentation 50%
Report 50% (Examination will not be required.)
1. **Outline**

There are a lot of chemical substances in the environment resulting in some serious effects on the body. However, recent molecular studies suggest that illnesses caused by exposure to environmental chemicals are attributable to the interaction with macromolecules like proteins in the organism. This lecture offers an opportunity to learn about a variety of symptoms caused from the exposure to chemical substances and the environment health perspective.

2. **Contents**

1st week Introduction.
2nd-3rd week Biological effects of environmental chemicals in the atmosphere
4th-5th week Biological effects of environmental chemicals in soil
6th-7th week Biological effects of environmental chemicals in groundwater
8th-9th week Molecular epidemiology and preventive medicine
10th week Summary

3. **Suggested Readings**

Listed during the course.

4. **Remarks**

The grade will be evaluated by attendance and group discussion.
01AD301  Introduction to Water Environment
3rd Term: Thursday 4 & 5 (13:45-16:30) (2 credits)
Teacher: Maki TSUJIMURA

1. Outline
The purpose of this class is to educate a capacity of understanding the water resources and water environment hydrologically and of clarifying the hydrological processes under a variety of environmental conditions. Additionally, students are encouraged to discuss actively on sustainable water resources management based on the real cases. This class aims to educate from undergraduate basic level to the master’s course level in the field of hydrology and water resources.

2. Contents
1st week  Principle of hydrology and water resources
2nd week  Interpretation of hydrological data
3rd week  Interpretation of water chemistry
4th week  Integrated understanding of various information on hydrology and water resources
5th week  Interaction between surface water and groundwater
6th week  Hydrograph component and runoff analysis
7th week  Groundwater recharge and discharge
8th week  Residence time of water
9th week  Integrated watershed management
10th week Sustainable groundwater management

3. Suggested Readings

4. Remarks
This class consists of lecture, discussion and exercise.
01AD302 Integrated water sciences and management
2nd Term: Monday 4 & 5 (13:45-16:30) (2 credits)
Teacher: Takehiko FUKUSHIMA

1. Outline
(1) Lecture on phenomena and problems relating to water hazard, water use, and water environment
(2) Exemplification of management tools and systems for them
(3) Discussion on how to solve water-related problems in developing countries

2. Contents

1st Takahiro SAYAMA (researcher of ICARM/Associated professor of GRIPS)
   ‘Water hazard and risk management’ on 6th September 2010

2nd Taro UCHIDA (senior researcher of Erosion and Sediment Control Research Group
   Volcano and Debris Flow Research Team in PWRI)
   ‘Water runoff and sediment management’ on 13th September 2010

3rd Takao MASUMOTO (leader of research team for Global Warming and Environment in National Institute for Rural Engineering)
   ‘Water resource planning’ on 22nd September 2010

4th Takashi NAGAI (researcher of Organochemicals Division in National Institute for Agro-Environmental Sciences
   ‘Risk assessment and management of chemicals in water’ on 27th September 2010

5th Akio IMAI (Head of Lake Environment Section of Water and Soil Environment Division in NIES)
   ‘Water quality indices’ on 4th October 2010

6th Kunihiko AMANO (Head of River Environment Division in NILM)
   ‘Management of river and reservoir environment’ on 18th October 2010

7th Yutaka SUZUKI (Head of Material and Geotechnical Engineering Research Group in PWRI)
   ‘Management of river and reservoir environment’ on 25th October 2010

8th Yoshio TSUBOYAMA (Head of Department of Soil and Water Conservation in Forestry and Forest Products Research Institute)
   ‘Management of river and reservoir environment’ on 1st November 2010
9th  Shogo MURAKAMI (counselor for Director-General for Policy Planning in Science and Technology Policy Council for Science and Technology Policy
‘Integrated management of watershed’ on 8th November 2010

10th  ‘Water management in developing countries’ *the date has not been fixed yet.

3. Suggested Readings

4. Remarks
Lecture and discussion in English by specialist on each topic. Reports for all lectures.
01AD604  Biodiversity
2nd Term: Tuesday 5 & 6 (15:15-16:30) (1 credit)
Teachers: Makoto M. Watanabe & Masakazu Aoki

1. Outline
Advanced lecture on biodiversity conservation and its sustainable use for answering the following questions; 1) how does the biodiversity support life on earth ?, 2) how do human activities cause changes in biodiversity ?, 3) what sort of losses in biodiversity represents a threat to humankind’s survival?, 4) how can we conserve biodiversity?, and 5) how should we plan ways of using natural resources and land that are in keeping with the conservation of biodiversity?

2. Contents
1st week  Species concept in terms of biodiversity conservation
2nd week  Estimation of global species number and creation mechanisms of biodiversity
3rd week  Biological, chemical and social factors causing loss of biodiversity
4th week  Effects of climate change on biodiversity
5th week  Relationship between biodiversity and ecosystem functions
6th week  Biodiversity assessment technology
7th week  Endangered species and their conservations
8th week  Regional biodiversity conservation
9th week  Sustainable use of bio-resources
10th week  Land management practices incorporating biodiversity conservation

3. Suggested Readings

4. Remarks
Course evaluation: Reports and course attendance
01AD307  Utilization and recycling of Bio-resources
3rd Term: Wednesday 1 & 2 (8:40 - 11:25) (2 credits)
Teachers: Zhenya Zhang & Norio Sugiura

1. Outline
A rapid food materials production increase is enabled in the 20th century by "Green revolution", hunger is overcome, and further prosperity has been accomplished. Now in the 21st century, the earth is confronted with a big problem like energy and the environment, etc. The understanding and the development example with a technological element of Bio-resources recycling are described. Also, we will describe the consideration of eternal harmony with the ecosystem in the homeostasis of the Bio-resources utilization system for making to the zero emission. The symbiosis environment systematization and advanced use for the Bio-resources are discussed for sustainable recycling society construction.

2. Contents
1st week  Base of concept, definition, term, amount of resource, and energy unit conversion of bio-resources
2nd week  General of wastewater, waste management, and recycling technology
3rd week  Development of advanced conversion technology of useful material from waste resource
4th week  Green energy development and view of hydrogen energy society
5th week  Amount of content energy of general of biomass, definition, classification, amount of biomass resource
6th week  The strategy and target of 「Biomass Japan」 for sustainable recycling society formation
7th week  Thermochemistry technology of biomass conversion----Burning, gasifying, pyrolysis, carbonizing, and making to ester
8th week  Biological biomass conversion technology---Methane fermentation and ethanol fermentation
9th week  Biological biomass conversion technology---- fermentation of acetone, butanol, and hydrogen
10th week The evaluation of green energy efficiency and CO2 exhaust amount by life cycle assessment (LCA)
3. Suggested Readings
N/T/S Publisher, “Hydrogen utilization technology collection”

4. Remarks
Course evaluation will be made based on class attendance and reports
1. Outline
This lecture aims at acquiring basic knowledge on different approaches toward sustainable forest administration and planning in developing countries. Firstly development and environmental issues will be globally outlined using statistical information provided by international organizations. Secondly various aspects of human-forest relations by eco-region will be introduced using visual materials. Then the vision will be widen from regional to global level again and international dialogues on the roles of forests in climate change and biodiversity issues are introduced, and finally efficiency of international assistance in the forestry sector will be discussed.

2. Contents
1st week Developed and developing countries: categorization by the UNDP and the WB
2nd week Global Forest Resources Assessment by FAO
3rd week Forest types by climatic conditions and characteristics of the ecosystems
4th week Lessons from forest administration in Japan
5th & 6th week Landscape as a result of human-forest relations: tropical monsoon forests
Cases: India and Thailand
7th week Landscape as a result of human-forest relations: tropical rain forests
Cases: Indonesia and Malaysia
8th week Landscape as a result of human-forest relations: savanna forests
Cases: West African countries
9th week Forests as global common properties: CDM and REDD
10th week Discussions

3. Suggested Readings
Most of international statistics can be downloaded from each organization such as FAO, UNEP and the World Bank.

4. Remarks
This lecture will be given in English with supports of Japanese if requested. Preparation for assignments to each participant at the time of lecture will be required.
1. **Outline**

Knowledge on international law is very important to understand global environmental problems. In this class, some topics which cover both international law and environmental problems will be discussed.

2. **Contents**

For the present, the following topics will be discussed in class;

- International Environmental Incidents
- Measures for Environmental Damage and Measures for Prevention
- International law related to bio-diversity preservation etc.

3. **Suggested readings**

Documents will be distributed within the class.

4. **Remarks**

For the present, this class will be held during the second semester in a form of intensive course.
1. Outline

“How can we contribute to accelerate a Great Transition toward Sustainable Civilization?”

Course Description: This course is designed to provide students an opportunity to think about to what sustainability means theoretically, culturally, ethically and philosophically by reviewing the historical and present contexts of Sustainability Study (or Sustainability Science) with special emphasis upon the social and cultural aspects to it. One reason why Sustainability has become one of the main contemporary concepts is that the present global environmental issues including climate change have made us to evaluate the modern civilization as un-sustainable, leading inevitably to the environmental degradation, the demise of economic stability, the increase of poverty struck population, the increase of pollution and waste and the unexpected social conflicts while admitting that modern civilization has contributed to creating the somewhat comfortable life style for the majority of world population, too. As the modern civilization prevails and the sense of the global Earth community emerges, it has become recognized that the present crisis is concerned with the historical transition of civilization. There have been the many contributions from scholars, experts and specialists of natural sciences and engineering. Yet, from the perspective of humanities and social sciences, it is needed to pay much more attention to the non-natural scientific dimensions, since the climate change and environmental issues will be effective upon every course of the human society. Natural science is also the cultural and social products of the natural scientists that are in turn the product of their own historical cultural and intellectual background. Ability to communicate and negotiate beyond the limits of the natural scientist’s academic community will be required when these natural scientists will work in the society. Each student will be asked to contextualize one’s own social and cultural position of his/her respective research discipline within the framework of the national and the international situations. Each student is required to do research on one’s own nation’s history and traditional values, and place the knowledge of natural science within the contexts. Each student is also requested to investigate basic philosophical and ethical problems concerning Sustainability. All of the related issues are to be examined cross-culturally and inter-disciplinary.
2. Suggested Readings

Selected Reference (The Full List of Reference will be given later in the class room.)


3. Remarks
01AD613 Introduction to Environmental Governance
2nd semester (1 credit)
Coordinator: Takahiro Endo

1. Outline
Lecturers mainly from the Ministry of the Environment, Japan will explain history, mechanism and policy-making process on environmental policies of Japanese government. This class covers wide topics including water quality problem, bio-diversity, sanitation issues, waste management, air pollution policy and regulations on chemical substances.

2. Contents
For the present, the following topics will be discussed in class;
- History of environmental policy in Japan
- Experience of public hazard (Kougai) in Japan
- Japanese perspective for sustainable development,
- Environmental policies toward low-carbon society
- Environmental policies toward less-waste society
- Conservation strategies of bio-diversity
- Air environment policy in Japan (regulations on Sox and Nox emission)
- Water environment policy in Japan (wastewater treatment and protection of water quality)
- Regulation on chemical substance in Japan (PCB, dioxin and asbestos)

3. Suggested readings
Documents will be distributed within the class.

4. Remarks
For the present, this class will be held during the second semester in a form of intensive course.
01AD310   Environmental Policy Appraisal
2nd Term: Thursday 1 & 2 (8:40-11:30) (2 credits)
Teacher: Yoshiro HIGANO

1. Outline
Since a variety of values intervene in environmental problems, policies based on decision-making process play important rolls. Therefore the proper appraisal framework is necessary for the environmental measures and the policy appraisal which is expressly conscious of not only the environmental level but also the environmental restoration and its technology is needed. In this class the basis of the environmental policy appraisal, structure of the simulation model and its applications are lectured being focused on the appraisal by the simulation.

2. Contents
1st week  The introduction
          Socioeconomic systems and resource-environmental problems
2nd week  Technology development and environmental policy
          Environmental remediation technology, R&D, eco-business, CDM
3rd week  Basic concept of policy and its appraisal
          Three balances of the comprehensive environmental evaluation
4th week  Biomass and socio-environmental system
          Utilization of biomass resources in the sustainable society
5th week  Simulation model 1
          Socioeconomic appraisal, the value flow
6th week  Simulation model 2
          Physical appraisal, the material cycle and energy flow
7th week  Example of the comprehensive appraisal
          The integrated watershed management policy
8th week  Examples of comprehensive environmental appraisal
          City Area Project: Synthesized appraisal of biomass utilization technology; Evaluation of the synthesized watershed management policy which considers water quality in the Lake
9th week  Discussion

3. Remarks
Evaluation: Reports 50%, Class attendance 50%