

Frontier of Sustainability Science 2016

Theme and Objectives

This course is designed to learn a great variety of researches conducted at the frontier of “Sustainability Science”, through the latest research outcomes of Sustainability Science Consortium (SSC). SSC is a research network for establishing a new academic field “Sustainability Science” among Japanese universities. By understanding a variety of academic fields related to sustainability and interactions among them, students will come to take part in the process of integrating several academic disciplines and establishing a new academic field “Sustainability Science”.

Description

This course consists of lectures by leading runners in SSC partner universities and general discussion and interaction part. Lectures will be offered from each university through TV conference systems and this course is the required course of “Joint Educational Program of SSC”. This course will be offered in English. In academic year of 2015, the course will be held on June 25, June 26, and July 2 as an intensive course.

		June 25		June 26	July 2
1	09:00-10:15	Lecture 1: Introduction (Ass. Prof. Makoto Tamura, Ibaraki U)	09:00-10:45	Lecture 5: Biodiversity and ecosystem service under climate change (Dr. Osamu Saito, UNU)	Lecture 9: 9:00~10:45 Climate policy (Prof. Akihisa Mori, Kyoto U)
2	10:30-12:15	Lecture 2: Introduction to IPCC's assessment system and overview of recent reports (Mr. Takahiko Hiraishi, IGES)	11:00-12:45	Lecture 6: Sustainable food resources management under climate change (Prof. Mitsuru Osaki Hokkaido U.)	11:00~12:45 1) Share the notes that you compiled during the 9 lectures with your group members 2) Discuss your group's focus on global climate change and sustainability issues 3) Prepare a PPT presentation slide on climate change policy
3	13:15-15:00	Lecture 3: Developments in international climate negotiations (Mr. Takahiko Hiraishi, IGES)	13:45-15:30	Lecture 7: Advanced energy technology for sustainable development (Prof. Satoshi Konishi, Kyoto U.)	13:45~15:00 4) Cont.- Prepare a PPT presentation slide on climate change policy
4	15:15-17:00	Lecture 4: Global and Local Environmental Issues and Adaptation Strategy in Tuvalu (Ass. Prof. Masafumi Fujita, Ibaraki U.)	15:45-17:30	Lecture 8: New Types of Renewable energy: prospects, development and intermittency issues (Prof. Esteban, U of Tokyo)	15:00~16:40 5) Presentation (about 7 min for each group and 3 min for Q&A by assigned people)
5	17:00-17:30	Group work instruction (Ass. Prof. Makoto Tamura, Ibaraki U)	17:30-18:00	Internal discussion	16:40~17:10 6) Students' and instructors' ballot for the best presentation
	17:30-18:00	Internal discussion			17:10~18:00 7) Comments and wrap up (Michinori Uwasu, Osaka U.) Concluding remarks (Motoharu Onuki, U of Tokyo)

Reading material

Before the lecture, students should read the following reading materials for the better understanding of the lecture contents.

<Compulsory reading material>

- IPCC AR4 Synthesis report ‘Summary for policy makers’

<Recommended reading material>

- Climate Change and Global Sustainability: A Holistic Approach (Sustainability science series), edited by Akimasa Sumi, Nobuo Mimura and Toshihiko Masui, ISBN 978-9280811810
<http://unu.edu/publications/books/climate-change-and-global-sustainability-a-holistic-approach.html#overview>

Frontier of Sustainability Science 2016 – Lecture abstract

June 25 (Saturday)

Lecture 1: Introduction (Tamura)

This lecture first explains the course objectives, duties, and scope. I then briefly cover the concepts, definitions and approaches of sustainability science while discussing current states and challenges of global sustainability. Highlights in our talk include the significance of climate change issues in sustainability, which aims to equip you with ideas/views useful for going through the series of lecture.

Lecture 2: Introduction to IPCC's assessment system and overview of recent reports (Hirahishi)

In order for the Intergovernmental Panel on Climate Change (IPCC) to be policy-relevant, but policy-non-prescriptive, the IPCC has established a participatory and unique peer review scheme for providing scientific basis on climate change for the world. Brief summary of recent reports will be provided, and discussions on the role of science for policy-making will be facilitated.

Lecture 3: Developments in international climate negotiations (Hirahishi)

With a focus on recent international negotiations on climate change under the United Nations Framework Convention on Climate Change (UNFCCC), including those at COP21, an overview of international negotiations and climate actions will be provided. Needs of climate mitigation and adaptation actions will be discussed.

Lecture 4: Global and Local Environmental Issues and Adaptation Strategy in Tuvalu (Fujita)

The lecture will focus on Pacific atolls, particularly Tuvalu, which is considered one of the most vulnerable to sea-level rise. First, global environmental factors in Pacific atolls reported by IPCC will be summarized. Then, local anthropogenic impacts on biological sand production that is critical for the development and maintenance of reef landforms will be explained. Finally, the lecture discusses the idea of adaptation for Pacific atolls.

June 26 (Sunday)

Lecture 5: Biodiversity and ecosystem service under climate change (Saito)

This lecture provides an overview and a multidisciplinary perspective on natural capital, biodiversity, human well-being and their interactions, as well as the integration of human needs and ecosystem functioning in ecosystem management and governance under climate change. The lecture will introduce the latest conceptual framework developed by the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), which has been promoting four key functions at the sub-global and global scales: assessment, knowledge generation, capacity building and policy support. Students will understand key concepts and tools of ecosystem assessment and management with the case studies from local and national to global scale.

Lecture 6: Sustainable food resources management under climate change(Osaki)

Food resources are mainly of water and soil, including biodiversity, which have been intensively affecting on climate change. El Niño causes to more drought or flood in some region rather than normal years. The lecturer will review crisis of food resources, then propose and discuss how manage food resources by sustainable ways, for which three ways are keys: 1) carbon sequestration in land, 2) land surface water management, and 3) MRV (measuring, reporting, and verifying) system.

Lecture 7: Advanced energy technology for sustainable development (Konishi)

Innovative energy technology and its possible application is lectured and evaluated, with nuclear fusion as a reference. Energy systems can be analyzed from its supply chain under the constraints of resource, transportation, response to the demands, as well as waste management and environmental impacts. Energy technology is inevitable for the modern society and its economic activities, and at the same time has various risks and external costs through environmental and social pathways. This lecture will provide a new methodology to consider the energy technology from the aspects of sustainable development.

Lecture 8: New Types of Renewable energy: prospects, development and intermittency issues (Esteban)

The lecture will deal with new types of renewable energy (including solar, offshore wind and ocean energy) and the problems they are facing, together with future development prospects in Japan and elsewhere. The issue of intermittency will be addressed, and whether this problem can be easily overcome."

July 2 (Saturday)**Lecture 9: Climate Policy (Mori)**

The lecture will deal with policies for low carbon, climate resilient development, with special focus on regulations, pricing and funding. Students will acknowledge the rationales behind the policy instruments, and barriers in implementing and enforcing these policies in practice.