

Lecture Schedule (Aug.-Sep., 2012)

Date	AM	PM
22 Aug		Depart Japan
23 Aug		Arrive in Richards Bay
24 Aug		Final schedule arrangement
25 Aug	Opening session Introduction of sustainability science-1 (Ikeda)	Introduction of environmental sciences and information technology-1 (Varlamov)
26 Aug	Introduction of global warming-1 (Ikeda)	Introduction of climate system-1 (Doi)
27 Aug	Introduction of sustainability science-2 (Ikeda)	Introduction of environmental sciences and information technology-2 (Varlamov)
28 Aug	Social impacts of global warming and sustainable development-1 (Ikeda)	Introduction of climate system-2 (Doi)
29 Aug	Practice of environmental sciences and information technology-1 (Varlamov) Introduction of global warming-2 (Ikeda)	Research reports and presentation of future plans-1 (All students)
30 Aug	Field trip to Umlalazi Natural Reserve	
31 Aug	Advanced lecture of climate system-1 (Doi) Social impacts of global warming and sustainable development-2 (Ikeda)	Research reports and presentation of future plans-2 (All students)
1 Sep	Practice of environmental sciences and information technology-2 (Varlamov) Social impacts of global warming and sustainable development-3 (Ikeda)	Presentation of climate change topics-1 (three universities)
2 Sep	Advanced lecture of climate system-2 (Doi) Social impacts of global warming and sustainable development-4 (Ikeda)	Presentation of climate change topics-2 (one university) Seminar on special topics (Varlamov and Doi)
3 Sep	Depart Richards Bay	
4 Sep		Arrive in Japan

## Lecture titles and objectives (Ikeda)

Introduction of sustainability science-1 (Aug. 25)

“Basics of sustainability science, Feedbacks among urgent issues/problems”

Introduction of sustainability science-2 (Aug. 26)

“Mistake in mitigation of one urgent issue, Bad impacts on the other issues”

Introduction of global warming-1 (Aug. 27)

“Mechanisms of global warming and climate change”

Introduction of global warming-2 (Aug. 29)

“Kyoto Protocol mechanisms and future approaches”

Social impacts of global warming and sustainable development-1 (Aug. 28)

“Natural disaster, East Japan earthquake as an example”

Social impacts of global warming and sustainable development-2 (Aug. 31)

“More issues such as natural resources and food security”

Social impacts of global warming and sustainable development-3 (Sep. 1)

“Equity among different generations”

Social impacts of global warming and sustainable development-4 (Sep. 2)

“Sea level rise caused by warming”

I put the highest priority on the basic concepts of climate change and sustainability science so that the students were able to understand these important problems which may grow around them. In order to make sure the better understanding, I included a discussion session in each lecture. The students formed small groups of five members and exchanged active discussion. After each session, a reporter presented the contents of discussion made in each group.

## Lecture titles and objectives (Varlamov)

### Introduction of Environmental Sciences and Information Technology-1 (Aug. 25)

“From global to regional specialized environmental information systems for needs of local customers and society: Introduction, examples and general discussion”

### Introduction of Environmental Sciences and Information Technology-2 (Aug. 27)

“Preparedness to respond on environmental disasters: Accidents on the sea: oil spills fate and drift analysis and related issues.”

### Practice of Environmental Sciences and Information Technology-1 (Aug. 29)

“Web applications in environmental information services for society and research community: Create our simple (static) web page”

### Practice of Environmental Sciences and Information Technology-2 (Sep. 1)

“Interactive web documents: Introduction in client-side web programming with JavaScript, Automation of environmental data processing: US/NCEP meteorological forecast data download and visualization”

### Seminar on special topics (Sep. 2)

"Basics of the ocean oil spill drift and fate modelling"

Starting with demonstration of best examples of information technology applications for serving users with environmental information, I emphasized students attention on the simple basic steps required for development of their own information systems for delivery of their research and development results to the end-users by means of Internet. In the first two lectures, the main target was to demonstrate and discuss HOW students could find, work with and add the value to the available environmental information. Examples of oil spill modeling and related drift forecasting services were demonstrated. In last two training lessons, more students were introduced in web development and created simple home pages. Data download and then its visualization for the weather analysis in South Africa were demonstrated at the last lesson.

Lecture titles and objectives (Doi)

Introduction of climate system-1 (Aug. 26)

“Global climate system”

Introduction of climate system-2 (Aug. 28)

“The southern African climate system”

Advanced lecture of climate system-1 (Aug. 31)

“Tropical climate variations and their social impacts”

Advanced lecture of climate system-2 (Sep. 2)

“Climate modeling and its prediction system”

Seminar on special topics (Sep. 2)

“Tropical Atlantic Variability simulated in the new high-resolution coupled climate model - GFDL-CM2.1 (our IPCC-AR4 model) vs. the new high resolution CM2.5”

Those lectures briefly review the principal factors controlling the global climate system and provide an introduction to the role of the atmospheric winds and ocean currents in maintaining the global and the southern African climate systems. Some scientific exercises and quizzes are included for better understanding. The lectures end with a note on the climate modeling and its prediction system. My lectures would be helpful to understand Prof. Ikeda's lectures for the Climate Change.

Observations and comments summarized by M. Ikeda

For the first time in our lecture series in South Africa, we stayed at one location and continued lectures for the same students. All three of us spent most of time for various lectures on basic topics of climate change, environmental sciences and sustainability science. In addition to our proposal, enthusiasm on the South African side (ACCESS and local host) made this arrangement possible and successful. George Sakurai made great efforts for the preparation.

The local hosts, Amos Mthembu and Hector Chikoore, stayed with the students at the classroom almost always. This participation was useful for keeping just appropriate tension within the students. The ACCESS personnel, Neville Sweijd and Carl Palmer, made the introductory presentations of the ACCESS objectives and possible supports for the students' activities. We asked all students to give presentations on their research topics and results. This information is very useful for us to grasp their interests and levels. In general, their ability is high with strong desire to grow up in research community and/or work places.

The students carefully listened to the lectures and asked questions very actively. They have strong desires to learn climate change, sustainability and web application. We were encouraged very much by their interest and strong will. However, we found that their understanding was suffered from lack of knowledge on basic mathematics and physics, which are crucial to better understanding of the topics. Although they seem to have experience with web usage for their research purposes, they have very limited knowledge of their own web application development. Therefore, if someone has a chance to give lectures on climate and web application development in future, they are suggested to take more step-by-step approaches.