Tokyo Institute of Technology Program for Leading Graduate Schools
Academy for Global Nuclear Safety and Security Agent (U-ATOM)

Newsletter

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U-ATOM

At the Academy for Global Nuclear Safety and Security Agent, we have a unique new nuclear education program featuring a full boarding system. We have named this program U-ATOM, combining the letter u (from "unique") with "atom."

Message from the Dojo Master, Masayuki Igashira

Activities for the Reform of Graduate-level Education

Until recently, we in graduate education focused too much on guiding students in research, without placing much emphasis on coursework. This resulted in an "octopus pot laboratory" situation (isolation from the rest of the world), and prevented acquisition of a wide perspective. In order to correct this, in the nuclear engineering major, since 2008, we have allowed students to spend the first semester of the first year of their master's program staying in the classroom without joining a specific laboratory.

We started to build balanced coursework in a way so that advice from the students' assistant advisors may enable systematic coursework-based education. In addition, students can experience many laboratories through the rotation system. Even after joining a certain laboratory, the assistant advisors are supposed to provide advice regarding coursework. We also carry out systematic research-guidance by, for example, organizing an intermediate review session while students are engaged in research for their theses.

Rationale for Leadership Training

For sustainable development of specific research fields and organizations in today's environment of globalization, wisdom, decision-making skills, communication skills, the ability to understand circumstances, and the ability to get things done are indispensable to becoming a strong leader. In postwar Japan, standardized education was heavily praised, leading to lack of leadership education. During the postwar period of revival and subsequent period of economic growth, the absence of leaders was not a problem, because the guiding principle was simply to follow a Western model. However, things have changed. Organizations and activities without leaders are certain to collapse. In Japan, which strives to be a world leader in science and technology, leadership training is absolutely crucial for the development of science and technology.

What Have We Been Doing at the Dojo?

We aim for comprehensive personal development at the dojo. All the seminars are supposed to be planned, managed, and implemented entirely by our students. I take every opportunity as the Dojo Master to provide appropriate guidance during the course of student discussions by offering advice and asking questions. It is my goal to improve the abilities of student to hold logical discussions as much as possible. In addition, I hold dojo lectures, wherein I invite experts and leaders from various fields (including humanities, society, and others) for lectures. In addition to broadening the students' perspective, I would like them to understand and apprehend the way these experts and leaders think. On top of this, I am encouraging students take responsibility for planning, managing, and implementation of all types of events at the dojo, which should serve to enhance their overall abilities.

Message to Students

To the first class of students, I would like you to make great strides toward developing each other's capacities with diligent study. We will spare no effort to help you in this regard. Each of you possesses your own unique viewpoints and ways of thinking. The dojo will be an excellent opportunity for your capacity building through discussion and learning from each other.

Students Create and Discuss Their Own Projects -- "The Hyotan Seminar"

Each week, students enrolled in U-ATOM courses carry out a seminar at the dojo under their own management. (We commonly refer to this as "The Hyotan Seminar.") This seminar, unlike in a laboratory, is intended to nurture global leadership, where students are engaged in discussion and work to develop a broad base of knowledge by examining a variety of topics such as "The Fukushima Accident," "President Obama's Speech (in English)," "Volunteer Activities," " Theory of Leadership," "Wisdom and Advice from Leaders in Various fields," and "Policy and Agenda of Each Political party in the Election of House of Representatives."

Because this was our first semester and we had to establish The Hyotan Seminar from scratch, there was some confusion and nervousness in the beginning, but the discussions gradually became deeper, and it has become a fruitful seminar.

In order to continue broadening our views and producing new ideas and thoughts, we plan to start inviting professors outside of the Titech to speak at The Hyotan Seminar on a monthly basis. If you are reading this newsletter and are interested in participating in or contributing a topic to The Hyotan Seminar, by all means, please contact us at u-atom@nr.titech.ac.jp. We'll be waiting for your message!

(Dojo Student Representative: Tatsuki Watanabe)

Outline of the Curriculum

This educational program aims to develop students who possess expertise in the nuclear power safety and security field and leadership, who can act as global leaders in industry, government, and academia in nuclear energy. In addition to the existing course topics, the Academy has also recently developed "Dojo Subjects," "Nuclear Safety and Security Courses," "High-level International Liberal Arts," and "Internship Subjects."

Global Nuclear Safety and Security Agent Education Courses

Course Topic/Course Semester Notes	Term	Remarks
Dojo Subjects (6 Courses 6 Credits; Required)		
Nuclear Dojo 1 (1-0-0)	2nd	Master course
Nuclear Dojo 2 (1-0-0)	1st	Master course
Nuclear Dojo 3 (1-0-0)	2nd	Master course
Nuclear Dojo 4 (1-0-0)	1st	Ph.D course
Nuclear Dojo 5 (1-0-0)	1st	Ph.D course
Nuclear Dojo 6 (1-0-0)	2nd	Ph.D course
Basic and Specific Courses in Nuclear Engineering (8 Courses 16 Credits; Required)		
Nuclear Reactor Theory (2-1-0)	1st	Master course
Nuclear Fuel Cycle Engineering (2-0-0)	1st	Master course
Nuclear Safety Engineering (2-0-0)	1st	Master course
Radiation Biology and Medicine (2-0-0)	2nd	Master course
Experiments for Reactor Physics (0-0-2)	1st	Master course
Experiments for Nuclear Fuel Cycle Engineering (0-0-2)	2nd	Master course
Regulations on Atomic Energy (1-0-0)	2nd	Master course
Global Nuclear Security (2-0-0)	2nd	Master course
Nuclear Safety and Security Courses (4 Courses 8 Credits; Required)		
Measurement of Environmental Radiation (1-0-1)	2nd	Master course
Simulation of Severe Nuclear Accidents (1-1-0)	1st	Master course
Environmental Dynamics of Radioactive Nuclides (1-1-0)	2nd	Master course
Nuclear Security Training (1-1-0)	1st	Ph.D course
Social/Communication Courses (3 Courses 3 Credits; Required)		
Ethics of Engineers (1-0-0)	2nd	Master course
Social Responsibility (1-0-0	2nd	Master course
*Nuclear Engineering Volunteer Activities 1 (0-0-1)	1st	Master course
*Nuclear Engineering Volunteer Activities 2 (0-0-1)	2nd	Master course
*Note: Please choose either Nuclear Engineering Volunteer Activities 1 OR 2.		
High-level International Liberal Arts Courses (9 Courses 9 Credits; Required)		
English and Globalization (1-0-0)	2nd	Master course
Global Politics and International Agencies (1-0-0)	2nd	Master course
French Language and Culture (1-0-0)	1st	Master course
Global Economy and Energy Strategy (1-0-0)	1st	Master course
International Nuclear Laws (1-0-0)	2nd	Master course
Far-East Asian History and Racialism (1-0-0)	2nd	Master course
Basics of Philosophy: Westerner and Orientals (1-0-0)	1st	Ph.D course
Basics of Culture and Civilization (tentative) (1-0-0)	1st	Ph.D course
Arts and Human (tentative) (1-0-0)	1st	Ph.D course
Internship Subjects (2 Courses 6 Credits; Required)		
Global Nuclear Internship in Japan (0-2-0)	2nd	Ph.D course
Global Nuclear Internship in Foreign Countries 1 (0-2-0)	1st	Ph.D course
Global Nuclear Internship in Foreign Countries 2 (0-2-0)	2nd	Ph.D course

Courses Special feature 1: Nuclear Safety and Security Courses

Measurement of Environmental Radiation

While mastering the measurement techniques for environmental doses and radioactive density in soil in order to understand the consequences of radioactive contamination due to a major nuclear disaster, we will carry out field work to monitor radiation levels in places such as Fukushima, utilizing various types of radiation measurement devices.

Simulation of Severe Nuclear Accidents

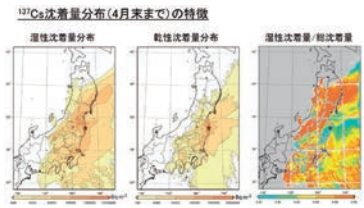
In the classroom, students learn about severe accidents that threaten the integrity of containment, as well as associated analysis codes.

Furthermore, lectures are given on the Fukushima accident with some details of the accident progression. Students use simulators to understand the behavior of boiling water reactors in transition, and accidents, including a severe accident.

Environmental Dynamics of Radioactive Nuclides

In order to cultivate the ability to rapidly calculate predicted dispersion and irradiation of radioactive material emitted during nuclear accidents, students will learn about our country's newest dose prediction code

Assessment of exposure to the public during a postulated severe accident will be done using a simulation model of radioactivity dispersion in the atmosphere.



From http://nsed.jaea.go.jp/ers/environment/envs/fukushima/

Nuclear Security Training

Through classroom education, students will understand the design of nuclear facilities, transportation of nuclear materials, the importance of nuclear security, and domestic and international protocol for transportation. Students will utilize existing training systems and learn about physical protection (PP) with its functions of intrusion detection systems, as well as how to use them. Students will gain practical experience by the use of detection devices against illegal intruders, and how to respond to them.

International Workshop at U-ATOM

At the Tokyo Institute of Technology on October 12th, 2012, in collaboration with Okayama University, we organized a workshop with the theme of "Nuclear Energy and Radioactive Waste Management." There were approximately 50 guests in attendance, including 10 from outside the country.

After opening remarks from Okayama University's Professor Yasuaki Ichikawa, Mr. Tadaoka Hideaki of MEXT welcomed the participants. In the morning session, this academy's program leader, Professor Yoshihisa Matsumoto, delivered a presentation titled "Radiation Effects of Human Health by Fukushima Accident." In the discussion that followed, participants expressed their views on the effects of low-level radiation on human body and the state of the art in risk communication. In the afternoon session, on the topic of nuclear fuel cycles and waste management, a presentation was made by Ms. Irene Male of the IAEA, followed by discussion. As was the case during the morning session, there was a lively debate and exchange of opinion. Finally, Program Coordinator Saito brought the successful workshop to a close with a word of thanks.

The Mentor Program Has Begun

This academy strives for excellence in capacity building for students-- not just for research but for social literacy and individual integrity. To support this objective, the Mentor Program is in place. Each student ("mentee") has two advisors and one staff member, who will provide support to the mentee in all aspects. Surveys, private meetings, and group meetings are used as tools to identify problems that students may face. While quickly dealing with any concern or problem students might have in their new environment, for example the diverse liberal arts curriculum or life at the dojo, the Academy will utilize this mentoring system so that students can stand by themselves and grow.

Sports Tournament

On December 8th, 2012, at the Dojo's gymnasium, the academy organized a sports tournament (futsal and table tennis) with faculty members, students, and staff. Such social events will continue for the rest of the campus life.

Introducing Students 1

高　雲
By Yun Gao

"To work for people and peace."

After graduating high school in China, I studied in Japan. I spent my college years at Niigata University's Engineering Department, majoring in Machine System Engineering.
I chose this academy, which focuses on development of global leaders in nuclear energy, because I plan to expand my perspective and learn about developments in nuclear energy across the world.
I believe in the phrase, "Think of people, love people," and would like to become the kind of person that can use my energy to work for people and peace.

坂田　雄紀
By Yuki Sakata

"My goal is to become a man of leadership and social literacy."

For six years in middle and high school, I belonged to a baseball club, and for four years in college, I was in the American football club. My hobbies are weight lifting and watching sports.
In this academy, I plan to learn many different topics, and acquire knowledge and gain a lot of experience in nuclear energy.
I would like to become a man of leadership and social literacy who can influence those around me. I would also like to continue sports, and hope to be a person with a good balance as a scholar and athlete.

初田　浩之
By Hiroyuki Hatsuda

"I will support the safety of nuclear energy across the world."

For six years in middle and high school, I belonged to a baseball club, and for four years in college, I was in the American football club. My hobbies are weight lifting and watching sports.
In this academy, I plan to learn many different topics, and acquire knowledge and gain a lot of experience in nuclear energy.
I would like to become a man of leadership and social literacy who can influence those around me. I would also like to continue sports, and hope to be a person with a good balance as a scholar and athlete.

深津　勇太
By Yuta Fukatsu

"The knowledge, experience, and wisdom that I earn here will enable me to shine."

In college, I majored in chemical engineering. My hobby is playing guitar. In between studying, I like to have a relaxing time playing guitar.
I chose the Nuclear Engineering major because I would like to study radioactive waste management.
I believe the knowledge, experience, and wisdom that I gain in this academy will enable me to shine in the future.
I always stay in an environment where I can grow, and continue striving for the top.

Second Nuclear Energy International Seminar Information

The 2nd International Seminar on Global Nuclear Human Resource Development for Safety, Security and Safeguards -Fukushima Daiichi Accident- (February 18th - 26th)

In 2011, the "Global Nuclear Safety, Security Agent Training Program," was chosen as one of MEXT's "Leading Ph.D Education Programs." This led to the establishment of the Academy for Global Nuclear Safety and Security Agent in 2012. In October 2012, the Academy started a residential nuclear energy “Dojo” at the Tokyo International Relations Building in Odaiba. The faculty members believe that students in the Academy, by working, learning, and holding discussions together with their professors, become well-educated Ph.D students.

From February 18th to 26th, we are planning an international seminar, "The 2nd International Seminar on Global Nuclear Human Resource Development for Safety, Security and Safeguards -Fukushima Daiichi Accident-" as one of the important educational opportunities in the Academy.

The plenary sessions on the first day (the 18th) and the morning of the second day (the 19th) are open to the public. Subsequent sessions from the afternoon of the second day onward, are available only to registered students. A mini field trip to the Fukushima area is planned over the weekend, to experience environmental radiation measurement. On Monday of the next week (the 25th), a visit to Tohoku Electric's Onagawa Power Plant is planned, where many locals took refuge after the earthquake and tsunami of March 11th, 2011. After studying how the plant managed the 3.11 disaster, participants return to Tokyo, on the final day (Tuesday, the 26th), each participating student will draft a summary report of the seminar, and present it before a closing ceremony when certificates of completion will be issued.

In this international seminar, the students will not only listen to lectures, but participate in discussion, an important opportunity for communication. The Academy has invited top students from other universities in Japan, young engineers from the industry, students and young engineers from abroad, and government officials, all to benefit from the seminar. The seminar is limited to 30 participants, who will be split into six groups. Each group will be specially assigned a mentor (advisor) from the academy's faculty to stimulate discussion.
For details about the seminar, please visit the website at http://www.nr.titech.ac.jp/u-atom/English/Events/.

Forum on Program for Leading Graduate Schools 2012

Date and time: March 15th (Fri.) - 16th (Sat.), 2013

Venue: Tokyo Conference Center, Ariake

Hosted by: Tokyo Institute of Technology

This is a forum held jointly by degree programs chosen as Leading Ph.D Education Programs. For details and participant application, please visit the website at http://leadingprogram-forum2012.jp/

Schedule

(2013)

2/2 - 2/12	European Training
2/18 - 2/26	The 2nd International Seminar on Global Nuclear Human Resource Development for Safety, Security and Safeguards
3/15・16	Forum on the Program for Leading Graduate Schools 2012
3/17 - 3/21	Fukushima Fieldwork
3/26 - 3/28	Atomic Energy Society of Japan Yearly Meeting, Spring 2013

In the next issue, planned for May, there will be reports from our visit to Europe, the International Seminar, Fukushima Fieldwork, etc., that the Academy is organizing in February and March. We look forward to your continued support. Please contact us if you have any questions or comments to share.

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