

Sub-Program/Component	Environmental Protection
------------------------------	---------------------------------

1.	University	University of Tsukuba (National)
	Graduate School	Graduate School of Life and Environmental Sciences
	URL of University	http://www.tsukuba.ac.jp/english/
	URL of Graduate School	http://www.life.tsukuba.ac.jp/en/index.html
	Program name	Master's Program in Environmental Sciences
	Degrees	Master in Environmental Sciences
	Credit and years needed for graduation	30 Credits, 2 Years

2. Features of University

The University of Tsukuba was established in October 1973 as the first comprehensive university in Japan to be operated under the central government's nation-wide university reform policy. The University has emphasized openness, innovative systems for education and research, and new university self-governance in undertaking the reform policy. Through its unique curriculum and research incentives, it has cultivated many students and scholars with advanced and creative knowledge that contributed to the good of the public as well as its excellence in research and education. The size of the University has expanded since its foundation and, as of April 2010, 10,051 undergraduate students and 6,777 graduate students are studying in degree programs. A total of 1,697 international students from 100 countries are enrolled in the University. The total number of university staff, including faculty members, is 4,262.

The concept of university reform still plays a major role in our continuing effort for improvement. We have always strived to be a unique, active, and internationally competitive university with superlative education and research facilities. Our effort has proved to be successful as the Japan Ministry of Education, Culture, Sports, Science and Technology, for example, recognizes in its 2009 publication that the University of Tsukuba is one of thirty "leading universities" in Japan. As of 2010, the University has produced three Nobel Prize laureates in physics and chemistry along with many distinguished scholars in sciences and humanities. Our distinguished kinesiology and sports department has produced several Olympic medalists.

The main campus is located in the north of the center of Tsukuba Science City, 60 km northeast of Tokyo (2,700 hectares). The five campus zones are linked by loop roads. Pedestrian and bicycle paths run through all five zones and reach the center of the city (As part of our effort to be environmental friendly, campus members are encouraged to commute by bus or bicycle). The City center is only 45 minutes from Tokyo by railway or bus. There are also direct bus services to the Narita International Airport (about 100 minutes) and the Haneda Airport (domestic and international) (about 80 minutes).

Tsukuba Science City has about 60 educational and research organizations such as the National Institute for Environmental Studies (NIES), the High Energy Accelerator Research Organization (KEK), the National Institute of Advanced Industrial Science and Technology (AIST), the Japan Aerospace Exploration Agency (JAXA), and various research institutes under the Agriculture,

Forestry and Fisheries Research Council. In addition, several private research institutions are located in Tsukuba. A close collaboration has been established between these research institutions and the University of Tsukuba through joint course/program operations at graduate levels such as the Cooperative Graduate School System for the Master's Program in Environmental Sciences and the Doctoral Program in Sustainable Environmental Studies with the National Institute for Environmental Studies. Another distinctive characteristic of the University is to have many affiliated universities and several overseas offices including Asia and Africa. As of March 2010, there are more than 170 affiliated institutions, which encompass 49 countries.

The University of Tsukuba has the on-campus industrial liaison center, which facilitates R&D cooperation between academic institutions and a number of on-campus venture companies. As of 2009, there were 65 corporations on campus (e.g., software, biomass conversion substances of biological resources, and medical analysis equipments). The University also has 27 inter-department education institutes, including the Center for Tsukuba Advanced Research Alliance (TARA), the Agricultural and Forestry Research Center, the Terrestrial Environment Center, the Shimoda Marine Research Center, and the Gene Research Center.

Another distinctive characteristic of the University of Tsukuba is its long commitment to environmental studies. The University established the Master's Program in Environmental Sciences in 1977, which was the first attempt among Japanese universities to provide graduate education for environmental studies. The Program has emphasized the concept of symbiosis with nature by reducing environmental burdens. It still exists today by admitting about ninety to one hundred students each year.

3. Features of the Graduate School

The Graduate School of Life and Environmental Sciences was established in 2000 by incorporating five preexisting graduate programs: Structural Biosciences, Functional Biosciences, Appropriate Technology and Science for Sustainable Development, Biosphere Resource Science and Technology, and Life Sciences and Bioengineering. The founding concept was to nurture researchers and train practicing professionals in the field of basic, applied and interdisciplinary studies in earth, life and environmental sciences.

Since then the Graduate School has expanded by adding more programs, including the Master's Program in Environmental Sciences and the Doctoral Program in Sustainable Environmental Studies. These programs have uniquely merged science-technology studies (e.g., environmental disaster prevention, hydrology, and meteorology including novel technologies against climate change, biodiversity, natural resource management, and remote sensing with special attention to the local as well as global environmental context, public health, soil resource management, urban planning, bio-resources recycling, waste management, and water treatment) with arts and humanities that are related to human development, economics, environmental ethics, law, policy evaluation, and ethno history. The strength of these programs is also seen in their diverse field-oriented practicum studies in Japan and overseas.

Since 2007, the Graduate School of Life and Environmental Sciences has offered ten doctoral programs, one five-year doctoral program, and four master's programs with more than two hundred full-time faculty members. Of these programs, the Master's Program in Environmental Sciences has accepted JDS fellows since 2007. As interdisciplinary education and research, international cooperation and international competency are important features of this Graduate

School and the University at large, JDS fellows are able to take English courses on wide-ranging topics that are offered by not only the Graduate School of Life and Environmental Sciences but also other graduate schools.

4. Features of the Program

Once admitted to the Graduate School of Life and Environmental Sciences, the University of Tsukuba, JDS fellows will belong to the **International Collaborative Environmental Program (ICEP)**, which was established in 2007 under the Master's Program in Environmental Sciences and the Doctoral Program in Sustainable Environmental Studies (hereunder both programs are called as the **Environmental Programs**). ICEP offers both international (including JDS fellows) and domestic students opportunities to complete the degree program in English with the aim of fostering internationally active experts and scientists. Since 2009, ICEP has developed into more specified and goal-oriented programs, namely the **Environmental Diplomatic Leader (EDL) Education Program** and the **Waste Management Expert Program**.

Based on these continuous developments in our graduate education in English, our JDS education will be evolved into a special program, namely the **JDS Program in Environmental Policy**. Scheduled to start from August 2012, this program aims to provide various field practices and studies by faculty members as well as special seminars and workshops by visiting lecturers to train young government officials sent from the JDS participating countries to be leading policymakers of tomorrow with scientific techniques and knowhow.

While these unique programs have added more interdisciplinary courses and new faculty members, they are fully backed up by the preexisting interdisciplinary curriculum of the Master's Program in Environmental Sciences, including practicum studies. Our experiences in running these all-English interdisciplinary education programs have made it possible for us to improve the quality of all-English education and student support, including global communication through websites, translation of all official documents into English, and more administrative staff who can deal with day-to-day student affairs in English. In addition, by using our extensive international and local networks with leading research institutes and universities in Japan and overseas, ICEP can provide the best environment for both domestic and international students to discuss environmental issues, which can ultimately lead to fostering global environmental leaders.

5. Necessary Curriculum to Obtain the Degree

As of April 2010, ICEP offers eight compulsory and thirty elective courses in English. The compulsory courses include the following introductory courses: **Cycle-oriented Environmental Studies** proposes to reduce environmental risks and create cycle-oriented society; **Environmental Symbiotic Studies** overviews the inter-relations between nature and people; **Field and Laboratory Works on Environmental Sciences** allows students to participate in hands-on experience of environmental history and current management, and **Environmental Ethics** seeks for possible directions that contribute to the solution of environmental problems. Other distinctive courses include international internships to various countries. Practicum courses both in Japan and overseas aim to advance individual research interests. Altogether, these opportunities have provided highly unique practical education experiences. Those who have successfully obtained thirty credits or more, including eighteen credits from the compulsory courses, receive the ICEP certificate. As of April 2010, seven students have received the certificate.

In addition, every JDS fellows must obtain additional four credits from the courses of “Environmental Policy and Planning”, “Environmental Policy and Governance”, “Field Seminar and Works on Environmental Policy and Planning” and “Field seminar and Works on Environmental Policy and Governance” as compulsory subjects. JDS fellows who earn all the credits required will receive the JDS special certificate in “Environmental Policy”.

In addition to completing the Master’s degree, ICEP and JDS programs that are must for all the JDS fellows, they may seek to participate in and complete the following partner program(s) depending on their interests.

The **EDL Education Program**, established in 2009, enhances our past effort to achieve the following three objective: (1) to foster originality and problem solving skills that have capacity for international mediations; (2) to deal with environmental governance (and go beyond management) that encourages the active participation of various stakeholders; and (3) to educate those who have knowledge about sciences and technologies that are related to the environment, environmental policies, ethics, legal systems, international relations, comparative culture and others. This environmental leadership program is very unique and innovative one in the world. This program aims to foster experts in three core fields: water resources, biodiversity and environmental public health. Three new faculty members joined the program in order to nurture experts in each one of the three core fields who also understand social problems, ethnic conflicts, political economy, and the law along with the acquired skills in policy negotiation. On top of existing courses, it has new introductory courses on English Presentation and Debate, Environmental Policy and Special Lectures on Environmental Diplomatic Leader. The Program also added international internships to China, Indonesia, Bhutan, Mongolia and Tunisia and urge students to participate in at least one of them to foster *glocal* visions. Those who satisfied designated requirements will receive the EDL certificate. (For details, visit the EDL website. <http://edl.envr.tsukuba.ac.jp/eng/index.html>)

The **Waste Management Expert Program** was established as one of the Environmental Programs as the University of Tsukuba was approved as one of several universities in Japan to promote the government’s higher education internationalization project (Global 30) in 2009. Making the best use of Japan’s advanced technology and knowhow in waste management, it aims to contribute to the solution of waste problems in developing countries, particularly in Asia, by nurturing experts on waste management, including the pollution from electric wastes. The Environmental Programs have one full-time faculty member for this particular program. The courses include Solid Waste Management System Planning, Electrical and Electric Waste Management and Environmental Microbiology. (For details, visit the G30 Waste Management Expert Program website. <http://www.global.tsukuba.ac.jp/programs/postgrad/wastemanagement.html>)

In addition to the above programs, credits from English courses offered by other programs and Graduate Schools, including the **Sustainable Rural Development** (SRD) course and Global 30 courses, can be accredited up to 10 credits as part of required credits for the degree completion. Apart from the environment-related courses, some JDS fellows in previous years have taken courses on Japanese folk culture, science communication, and thesis writing that are accredited as a part of the Master’s Program in Environmental Sciences.

The Graduate School of Life and Environmental Sciences is also active in environmental disaster prevention and management. The **Environmental Disaster Prevention Program** responds to the needs to deal with increasing and intensifying environmental disasters (e.g., flood and landslides) that are partly caused by global warming. This program invites experts from the government (mainly the Japan Ministry of Land, Infrastructure, Transport and Tourism) and other organizations who will share their experience with students. It also will include courses on disaster control law and risk management. Although this program is so far provided mainly in Japanese, the school is making efforts to open courses also for international students, considering the increasing needs from the global society.

6. Academic Schedule

The Master's Program in Environmental Sciences has adopted the advisory committee system for the instruction of individual study/research. The standard term for completion of the master's program is two years, which consist of six trimesters. Followings are the academic schedule applied to JDS fellows:

ENTRANCE (August 2012)

FIRST YEAR (August 2012-July 2013)

First trimester (August-November):

- Academic mentor, research advisors and research theme selected

Second trimester (December-March):

- Taking classes of elective subjects
- Presentation on the research background

Third trimester (April-July):

- Taking classes including compulsory subjects
- Presentation on the research topic

SECOND YEAR (August 2013-July 2014)

First and second trimester (August-March):

- Taking classes of elective subjects
- Interim oral presentation
- Completion of Seminar in Environmental Sciences
- Completion of Advanced Seminar in Environmental Sciences

Third trimester (April-July):

- Completion of Special Research in Environmental Sciences
- Final Presentation
- Oral defense of the thesis

GRADUATION (July)

7. Facilities

The University of Tsukuba student residences offer its students the affordable and convenient study environment. In total, there are 60 residences with 3,472 single-bed units, 269 two-bed units, and 186 family housings on campus. Every room is furnished with a bed, a table, a washbasin, a dormitory telephone and others. Every residence complex has a laundry room and communal kitchens. Also (excluding Kasuga campus) there is on-campus community center that has all the facilities necessary for day-to-day living such as a dining room, a bathhouse, a convenience store and a beauty and hair salon. Students may also walk off-campus to buy necessary goods.

If a number of new applicants exceed the available number of rooms, students from different district/state or country are given priority to local students, who can possibly commute to the University. The monthly rent is 6,700 yen, which should be paid with a common utility fee of 7,140 yen per month and private utility fees (e.g., electricity).

There are also plenty of private apartments and condominiums around the University campus in Tsukuba. Apartments can be found by getting information from senior students, acquaintances or real-estate agents. Accommodation information is also available at the Department of Academic Affairs, Division of Student Welfare on campus. Average monthly rent ranges between 35,000 to 50,000 yen for a single room with kitchen and bathroom (approximately 20m²).

8. List of Faculty Members Capable of Guiding JDS Fellows

Professor

Yoshiro HIGANO

Socio-economic System Analysis

Misa MASUDA

Rural Resources Management and Forest Conservation in Developing Countries

Naomi WAKASUGI

Environment and Human Health

Kunihiko YOSHINO

Monitoring Natural Environment, Environmental Change Prediction and Environmental Impact Assessment, Policies for Environmental Preservation

Zenya ZHANG

Bioresource Process Engineering

Associate professor

Takahiro ENDO

Water Resource Management Policy

Akinobu MURAKAMI

Horticultural Science, Landscape Architecture

Maki TSUJIMURA

Hydrology, Hydrogeology

Helmut YABAR

Waste Management and Policy

Assistant professor

Naoko KAIDA

Environmental Economics and Policy Studies, International Cooperation

Kenichi MATSUI

History of Thought, History of the Western World, Anthropogeography

Xiaogang SUN

Ecological Anthropology

9. Message for Applicants

As part of our long-term efforts for public accountability and research and education innovation, the University of Tsukuba has sought a viable vision for educating future environmental leaders. What kind of leaders does the world need to solve environmental problems? The Master's Program in Environmental Sciences and the Doctoral Program in Sustainable Environmental

Studies have spearheaded this vision-quest by regenerating innovative environmental programs, both in English and Japanese.

It is our pleasure that we can challenge the new era of the global environment with young and promised researchers from Mongolia. We are ready to provide students many opportunities to study global warming and climate change issues such as studies on watershed management, water resource management, hydrology and large scale material flows as well as global circulation modeling and climate simulation. Furthermore, JDS fellows can engage in policy studies on mitigation of climate change such as REED(+), A/R and CDM.

JDS fellows can also participate in special field trips that faculty members arrange and guide for them. The trip menus are tailor-made in response to the JDS fellow's research needs and interests, and topics in the past trips include protected area management, biodiversity, ecological services and other environmental policy and management issues. Through these activities, JDS fellows can communicate with Japanese experts and local residents and learn about the Japanese environmental history, culture and the up-to-date environmental management.

Within the Environmental Studies Programs (with more than 70 full-time faculty members), a group of faculty members as the JDS Committee have always been committed to the improvement of their educational support for JDS fellows. This committee clearly demonstrates our dedicated volunteer spirit and commitment to the good of assistance needed nations. We recognize that this work is part of our access-and-benefit-sharing activities. Our university philosophy of "openness" proves importance here. We strive to secure the open educational and research environment, in which students from any nation regardless of gender, age, race and nationality can have equal access to high quality education and research facilities. Other than daily email communication among committee members and JICE respondents, the JDS Committee meets on a regular basis and actively discusses how we can improve our JDS program. It also coordinates support among other existing faculty committees (e.g., EDL Committee, Curriculum Committee) and working groups. The JDS Committee has launched its own website to share program activities and updates with the prospective, currently enrolled and alumni JDS fellows. The committee is making continuous efforts to make the website more accessible and informative.

<http://www.envr.tsukuba.ac.jp/~jds/>

We are proud of our JDS Program in Environmental Policy to enable us to provide high level of education to promised young policy experts, backed up by cooperation, coordination and commitment of the school faculty members and the university as a whole.