

Sub-Program/Component	Environmental Protection
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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	International Collaborative Environmental Program, 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, new 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 and excellence in research/ education. The size of the University has expanded and as of April 2009, there were 10,190 undergraduate students and 6,556 graduate students. Among them, there were 1,527 international students from 101 countries. The total number of university staff, including faculty members, is 4,182.

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 Ministry of Education, Culture, Sports, Science and Technology, for example, recognizes in its 2009 publication that the University of Tsukuba is one of thirteen "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 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. A promenade called "Pede" 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 connected to Tokyo by railway and bus within the distance of about 45 minutes. There are also direct bus services to the Narita (Tokyo) International Airport (about 100 minutes) and the Haneda Domestic Airport (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 between the Master's Program in Environmental Sciences/ the Doctoral Program in Sustainable Environmental Studies and the National Institute for Environmental Studies. Another distinctive characteristic of the University is to have many affiliated universities and several overseas offices in developing countries such as 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 Graduate School

The Graduate School of Life and Environmental Sciences was established in 2000 by incorporating five preexisting graduate programs such as 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., bio-resources recycling, environmental microbiology, environmental disaster prevention, hydrology, meteorology, public health, remote sensing, soil resource management, urban planning, waste management, water treatment) with arts and humanities that are related to human development, economics, environmental ethics, law, policy evaluation, and ethnohistory. 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/ 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 or ICEP**, which was established in 2007 within 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 has offered both international (including JDS fellows) and domestic students an opportunity to complete the degree program in English with the aim of fostering internationally active experts and workers. More recently ICEP has developed into more specified and goal-oriented programs such as the **Environmental Diplomatic Leader (EDL) Education Program** and the Global 30-funded **Waste Management Expert Program** since 2009 fiscal year. Although these unique programs have added more interdisciplinary courses and new faculty members, they also have benefited from 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 web sites, the translation of all official documents into English, and the hiring of more administrative staff who can deal with official matters 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 a place for both domestic and international students to discuss environmental issues, which can ultimately lead to fostering global environmental leaders.

5 . Necessary Curriculum to Obtain to the Degrees

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 China, Indonesia, and Bhutan. Practicum courses both in Japan and overseas aim to advance individual research interests. Altogether, these opportunities have provided highly unique practical education experience. Those who obtained thirty credits or more, including eighteen credits from compulsory courses, receive the ICEP certificate. As of April 2010, seven students have received the certificate.

The **EDL Education Program** was established in 2009 mainly to foster experts in one of three core fields: water resources, biodiversity and environmental public health. It has hired three new faculty members with aims of producing experts in one of the three core fields, who also understand social problems, ethnic conflicts, political economy, and the law along with the acquired skill in 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 global visions. Those who satisfied designated requirements will receive the EDL certificate.

The **Waste Management Expert Program** (or Course) was established in the Environmental Programs as the University of Tsukuba was approved as one of several universities in Japan to manage the government's internationalization project (Global 30) in 2009 fiscal year. It

aims to contribute to the solution of waste problems in developing countries by producing experts on waste management, including the pollution from electric wastes. The Environmental Programs have hired one full-time faculty member for this program. Courses include Solid Waste Management System Planning, Electrical and Electric Waste Management, and Environmental Microbiology.

In addition to above three 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. Some JDS fellows have taken course on Japanese folk culture, science communication, and thesis writing courses that were accredited by the Master's Program in Environmental Sciences.

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 six trimesters. Followings are the academic schedule applied to JDS Fellows:

ENTRANCE (August)

FIRST YEAR

Second trimester (August-November):

- Academic mentor, research advisors and research theme selected

Third trimester (December-March):

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

SECOND YEAR

First trimester (April-July):

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

Second and third trimester:

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

THIRD YEAR

First trimester:

- 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 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 for necessary goods.

If a number of new applicants exceeds 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 residents have to pay a monthly rent of 6,700 yen, a common utility fee of 7,140 yen per month, and private utility fees (e.g., electricity).

In addition, there are plenty of apartments and condominiums around the University campus in Tsukuba. Apartments can be found by getting information from your senior students, acquaintances or real-estate agents. Accommodation information is also available at the Department of Academic Affairs, Division of Student Welfare. Average renting fees ranges between 35,000 to 50,000 yen for a six-mat room with a kitchen, a bath and a toilet.

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 nations

Yuichi ONDA

Landslide mechanism, runoff generation mechanism and sediment yield, soil erosion and environmental issue in forest plantation, remote sensing

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

Maki TSUJIMURA

Hydrology/Hydrogeology

Helmut YABAR

Waste management and policy

■Lecturer

Akinobu MURAKAMI

Horticultural science, Landscape Architecture

■Assistant professor

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 effort for public accountability and research/ education innovation, the University of Tsukuba has sought a viable vision for educating future environmental leaders. What leaders does the world need to mitigate 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 new environmental programs, both in English and Japanese.

Most recently, these Environmental Studies Programs established the Environmental Diplomatic Leader (EDL) Education Program (<http://edl.envr.tsukuba.ac.jp/eng/index.html>). In answering to the question above regarding the viable leadership vision, it emphasizes that the future leader “needs a deep understanding and recognition of culture and its environmental, economic, political and social backgrounds.” Indeed it has been our educational philosophy in the last thirty-three years that environmental scientists must go beyond narrowly defined expertise and embrace wide-ranging interdisciplinary and field-derived studies. In order to achieve this end, the EDL program 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. Even some North American university programs that strongly emphasize environmental leadership have not come this far yet.

The Waste Management Expert Program (all-English program) and the Environmental Disaster Prevention Program (mainly in Japanese) also began in 2009 with more specialized objectives for expert education within the Environmental Studies Programs. The former responds to the needs to deal with increasing solid wastes, including e-wastes, in Asian countries. Japanese technology and experience can clearly make a significant contribution to this area by not only sending Japanese experts but also educating those from Asian countries. The latter 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 (especially 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.

The strength of the Master's Program in Environmental Sciences can also be found in its rich practicum study programs. All students, including JDS fellows, will participate in excursions for observing waste management, climate change observation, Japanese traditional ecological practices (called “Satoyama”), watershed management (disaster controls), and environmental history (e.g., pollution). JDS fellows also have participated in special field trips that were arranged for them and accompanied by one or more faculty members to experience guided-tours for protected area management, biodiversity, ecological services, and other environmental policy related topics. The contents of these trips change in response to JDS fellows' needs and interests. Through these activities, JDS fellows can communicate with Japanese experts and local residents and learn about Japanese environmental history, culture and contemporary environmental management.

Within the Environmental Studies Programs (with more than 70 full-time faculty members), at least several faculty members have always been committed to the improvement of their educational support for JDS fellows by forming the JDS Committee. 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 almost daily email communication among committee members and JICE respondents, the JDS committee meets at least monthly and actively discusses about how we may 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 is currently building its own web site for JDS fellows so that they may find our JDS program more accessible and informative. We strongly believe that not many universities have this high level of cooperation, coordination and commitment within the graduate program with more than seventy faculty members.