

Hiroshima University (National) Graduate School of Advanced Science and Engineering

JDS Cambodia

Sub-Program 1. Industrial Development
Component 1-1. Enhancement of Industrial Competitiveness
1-1-1. Infrastructure Development

Program	Division of Advanced Science and Engineering, Transdisciplinary Science and Engineering Program	
Degree(s)	a. Master of Philosophy b. Master of Engineering c. Master of International Cooperation Studies	
Credit and duration	30 credits, 2 years	
Address	1-5-1 Kagamiyama, Higashi-Hiroshima-shi, Hiroshima, 739-8529, Japan	

Features of University (<http://www.hiroshima-u.ac.jp/index.html>)

Hiroshima University (HU) was established by combining eight existing institutions in May 1949 under the National School Establishment Law. Later in 1953, the Hiroshima Prefectural Medical College was also added to the new HU. Some of these higher educational institutions already had brilliant traditions and histories of their own. Although these educational institutions suffered a great deal of damage due to the atomic bomb, which was dropped on Hiroshima on August 6, 1945, they were reconstructed and combined to become the new HU. In addition, Graduate Schools were established in 1953. The new HU has risen from the ruins of war like a phoenix, which is in fact the University's symbol.

HU has a long history of accepting international students. This commenced before World War II. As of May 2019, HU has over 15,000 students including nearly 1,900 international students from 72 countries.

For details about education and students life at Hiroshima University, please visit the following websites.

Education and Students Life:	https://www.hiroshima-u.ac.jp/en/explore_hu/support
https://www.hiroshima-u.ac.jp/en/explore_hu	Life:
Learning:	https://www.hiroshima-u.ac.jp/en/explore_hu/life
https://www.hiroshima-u.ac.jp/en/explore_hu/learning	Photos:
Timeline:	https://www.hiroshima-u.ac.jp/en/explore_hu/photo
https://www.hiroshima-u.ac.jp/en/explore_hu/timeline	Videos:
Support:	https://www.hiroshima-u.ac.jp/en/explore_hu/videos

Features of Graduate School (<https://www.hiroshima-u.ac.jp/en/adse>)

The Graduate School of Advanced Science and Engineering is established as a flexible education and research organization by reorganizing the existing graduate schools and major courses for science and engineering in Hiroshima University. It consists of two major courses (Division of Advanced Science and Engineering, Joint International Master's Programme in Sustainable Development (Hiroshima University and Leipzig University)) that contains 14 diploma programs.

The Division of Advanced Science and Engineering is established as a school for science and engineering to develop human resources who will take a central role in the exploration of unknown scientific principles and technological and scientific innovation in the future. Because securing advanced knowledge and expertise is an essential foundation for human resource development, the Division of Advanced Science and Engineering consists of the following programs: science programs for developing wide range of fundamental expertise, i.e. (1) Mathematics Program, (2) Physics Program, (3) Earth and Planetary Systems Science Program, and (4) Basic Chemistry Program; engineering programs, i.e. (5) Applied Chemistry Program, (6) Chemical Engineering Program, (7) Electrical, Systems, and Control Engineering Program, (8) Mechanical Engineering Program, (9) Transportation and Environmental Systems Program, (10) Architecture Program, and (11) Civil and Environmental Engineering Program; and (12) Informatics and Data Science Program which is a diploma program for systematically developing not only the data processing and analysis capabilities required for various areas of expertise related to science, engineering, and other fields but also knowledge and skills related to informatics that are the basis of capabilities needed to meet social needs.

In addition, the Division of Advanced Science and Engineering includes the (13) Quantum Matter Program in which students can study basic materials science, condensed material physics, and electronic engineering beyond the border. Additionally, the (14) Transdisciplinary Science and Engineering Program provides education and research activities based on the existing specialized fields of science and engineering while integrating the existing academic frameworks beyond the border from a nature- and human-oriented bird's eye view. This allows Japanese and foreign students to cope together with complicated social needs and challenges in Japan and abroad without considering the difference of their specialized fields.

Features of the Program (https://www.hiroshima-u.ac.jp/en/adse/div_adse/program#p14)

The Transdisciplinary Science and Engineering Program aims to develop a "knowledge-intensive society" by merging the existing academic systems beyond the border among them from a bird's eye view while being based on the core area of expertise such as the natural environment, natural disasters, integrated physics, information system, media, and development technology. To achieve the aim, the Program educates students to obtain expertise and research skills for environmental problems, environmental risks related to resources and energy problems, elemental sciences and systems regarding areas from the materials for life and ecosystems, and environmental information related to the system in which mankind coexists with information technology and the media from a nature-oriented point of view. Students will also develop an ability to contribute to society based on understanding and insight for the natural science and information science throughout the Program. In addition to this, from a human-oriented point of view, the Program encourages students to research the theories and analysis methods for the development of human-oriented technology for development issues in developing nations such as urban development, community development, industrial promotion, and environment protection to obtain an ability to globally contribute to sustainable development.

In addition, the Program is organized as a multi- and inter-disciplinary diploma program in which Japanese and foreign students with various academic backgrounds study together to realize innovation domestically and internationally in cooperation with advanced professionals in various fields. The Program develops researchers and educators who understand a human-oriented point of view and have obtained research abilities, expertise, professional skills, and cross-disciplinary points of view for the areas of core expertise and related areas such as the natural environment, natural disasters, integrated physics, information system, media, and development technology. The program will also foster technocrats and advanced professionals who have a bird's eye view and problem solving capability based on understanding of diverse cultures and global insight.

The program consists of two field, Development Science field and Environmental and Natural Sciences field. JDS fellow will be basically enrolled in the former, but they can also take classes provided by the latter or conduct collaborative researches. Below is the information on the Development and Science field.

Key Features of Education

(1) Education Programs in English

We believe it is important to develop international professionals capable of writing academic articles and reports, communicating and conversing in English. Therefore, all lectures and seminars are provided in English.

(2) Systematic and Interdisciplinary Curriculum

We offer a systematic and interdisciplinary curriculum to produce specialists who can contribute to international development and cooperation in ways that cut across established academic disciplines. We offer integrated education and research programs in Urban and Transportation Engineering, Energy Science, Risk Management, Biological Science, and Environmental Health Science to develop interdisciplinary and global perspectives.

Special Education Programs

We offer special education programs designed to improve the qualifications and skills of students who plan to work in the field of international cooperation. The main features of these programs are as follows.

(1) Global Environmental Leaders Special Education Program

One of our aims is to establish a center for training environmental leaders capable of identifying problems and formulating strategic solutions at national or local levels through interdisciplinary and international perspectives. The global issue of reducing carbon emissions is an example of such a problem and the need for solutions. Another aim is to provide a platform for collaboration between industry, government and academia to promote cutting-edge environmental research and create coherent practical solutions for environmental issues on a global scale that is not limited to developing countries. We seek to provide value-added knowledge to those engaged in international cooperation. Achieving these aims requires addressing five areas: urban system design to prevent global warming, wise use of biomass resources, environmental impact assessment, policy and institutional design and environmental education. Our intention is for developing countries to work hand in hand with Japan to develop international environmental leaders, a task that we will undertake in an effective and practical manner.

For more details, refer to https://www.hiroshima-u.ac.jp/en/idec/education/special_education/courses/gels

(2) Formation of a Strategic Center for Global Internship (G.ecbo)

HU is currently promoting the "Formation of a Strategic Center for Global Internship" (commonly known as the "G.ecbo program") following the 2007 adoption of the Support Program for Improvement of Graduate School Education. G.ecbo is a practical education program that includes pre- and post-internship training designed to achieve viable outcomes from student internships. The following types of internships are available:

- (1) Overseas internships, in which students go to a university or organization outside Japan.
- (2) Domestic internships, in which foreign students go to a Japanese company or organization.
- (3) Third-country internships, in which students from developing countries go to institutions in other developing countries.
- (4) Follow-up research internships, in which students in doctoral programs go back to countries where they have previously worked.

Necessary Curriculum to Obtain the Degrees (<http://idecdt.hiroshima-u.ac.jp/curriculum/>)

To obtain a Master's degree, JDS Fellows need to satisfy the following requirements:

- Minimum of 30 credits through program work;
- Submission of a master's thesis.

All students need to decide research topic and supervisors (one head-supervisor and two sub-supervisors) at the beginning of the first semester. Under the head-supervisor's advice, students will choose subjects to enroll and start preparations for a master's thesis.

List of subjects offered in 2020 academic year is attached. Students will choose subjects mainly from "Transdisciplinary Science and Engineering Program".

(URL: https://momiji.hiroshima-u.ac.jp/syllabusHtml_en/2020_E90114_en.html)

Transdisciplinary Science and Engineering Program Master's Course

List of faculty members capable of guiding JDS Fellows

(<https://www.hiroshima-u.ac.jp/en/adse/research/transdisciplinary-science-and-engineering>)

Students need to decide their research topic and supervisors (one head-supervisor and two sub-supervisors) at the beginning of the first semester. Under the head-supervisor's advice, students will choose subjects to enroll and start preparations for their master's thesis.

Specialty	Research Fields	Academic Staff
Regional and Urban Planning, Transport Policy, Energy Policy, Tourism Policy, Health Policy	Various urban, transportation, environment and energy, health, and tourism issues are targeted from the viewpoint of mobilities and urban policy. Relevant research deals with the development of methodologies, technological development, and policy evaluation and formulation for problem solving based on interdisciplinary approaches.	ZHANG Junyi
Environmental Planning	Living environment planning in buildings and urban area: water environment, landscape and environmental psychology	NISHINA Daisaku
Transportation Engineering, Transportation Planning	Transportation planning methods, evaluation of transport policies, and sustainable development and transport	FUJIWARA Akimasa
Environmental Health Science	Epidemiological study focusing on environmental health problems, Development of health care system based on spatial statistics	KASHIMA Saori
Sustainable Architecture	Building and urban environmental science for achieving sustainable development in developing world	KUBOTA Tetsu
Urban Environmental Science	Urban Climate Change Mitigation and Adaptation; Nature-based Solutions; Green Infrastructure; Urban Microclimate, Urban Resilience; Sustainable Urban Forms; Assessment Tools.	SHARIFI AYYOUB
Risk Management Technology	Urban risk management / Advanced infrastructure planning /Activity-based analysis	CHIKARAISHI Makoto
Biomass Energy Technology, Botany Resources for the Future	Development of biomass energy technologies and application to developing countries Agricultural ecology and development of sustainable agricultural technologies	TRAN Dang Xuan
Ecosystem Conservation and Management Science	Research and education on ecology and ecosystem management	HOSAKA Tetsuro
Energy Science and Technology, Coastal hazards and Risk management	Renewable energy evaluation and management in developing countries, Numerical models for coastal hazards·disaster prevention·mitigation, Evaluation of climate changes on natural hazards and renewable energy environment.	LEE Han Soo

Academic Schedule

(Reference)

Fall Semester (October 1 - March 31)

October 1	Entrance Ceremony, Orientation
October 1 - February 15	Classes
Early October	International Student Orientation (University-wide)
Mid October	Deadline of Class Registration
November 5	University Anniversary Day
December 26 - January 5	Winter Vacation
February 16 - March 31	End-of- Academic-Year Holidays

Spring Semester (April 1 - September 30)

April 1 - April 7	Spring Vacation
April 8 - August 10	Classes
Mid April	Deadline of Class Registration
End of July	Thesis Submission
Mid-August	Thesis Defense
August 11 - September 30	Summer Vacation
September 20	Graduation Ceremony

Facilities (<https://www.hiroshima-u.ac.jp/en/centers>)

Dormitories

"Ikenoue Dormitory" (approx. 180 rooms for international students) and "International House" (60 single, 10 family units) located on the Higashi-Hiroshima campus are available for international students. The majority of students, however, live in privately-owned apartments.

Library

Our library has nearly a collection of 30,000 titles of books and journals. Our collection is mainly focused on economics of development, education development, international relations and Asia regional culture development.

"World Bank Information Kiosk" is placed for the purpose of introducing active discussions in academic area about the policy and actions of the World Bank. Students can access to "World Development Indicators Online" in our library. Flag ship publications, project reports, brochures and publications from the World Bank Tokyo Office are also available.

JDS fellows have full access to 5 other libraries on campus which has approximately 3,300,000 materials in its collection. Holding a huge collection of books and electronic journals, with a total combined area of 29,000 square meters, Hiroshima University Library System comprised of 5 libraries is one of the largest in the country.

Other facilities

Within the campus, we have welfare facilities such as various cafeteria, a travel agency office, stores, book shops, a drug store and a barber shop. Hiroshima University also has a post office, a university health service center, and a dental clinic in the campus. The International Center provides mental counseling service to international students in English.

Message for Applicants

HU is a research based university. In line with this policy, we requires a thesis for the fulfillment of the master's degree, which is different from the coursework-based curriculum typically found in professional schools. It is not a very easy task to compile a master's thesis based on independent research. In fact, students need to spend significant time and resources. However, it is expected that this experience will enable you to acquire specialized academic and practical knowledge in your area of specialization. To ensure that you can pursue research of a high standard that achieves a good result, at the time of joining our program we require applicants to have a good command of English. Some knowledge of civil engineering or agricultural studies for designing a sustainable infrastructure is also highly desirable.

Our aim is to foster advanced specialists who can contribute to solution of the issues of the sub-program and component, such as improvement of social infrastructure from the viewpoint of hardware and software sides, and improvement of urban and regional problems by considering interaction between industrial location, land use, environment, human life, disaster prevention, etc., we provide the special program for students to obtain these knowledge and skills through theoretical and empirical lessons with practical cases.

In the campus surrounded by abundant nature in the suburbs of Hiroshima city, you can give your full attention to your study. Your each and every experience here will serve as an excellent base for your further steps as a professional government official. We welcome you to Hiroshima University.