

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

◆ Program name

Division of Advanced Science and Engineering,
Transportation and Environmental Systems Program

◆ Degrees:

Master of Engineering

◆ Credit and years needed for graduation:

30 credits, 2 years

◆ Address:

1-4-1 Kagamiyama, Higashi-Hiroshima-shi, Hiroshima,
739-8527, Japan



Features of University <http://www.hiroshima-u.ac.jp/en>

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 2026, HU has over 15,000 students including approximately 1,900 international students from about 92 countries. For details about education and student's life at Hiroshima University, please visit the following websites.

Education and Students Life: https://www.hiroshima-u.ac.jp/en/explore_hu

- Learning: https://www.hiroshima-u.ac.jp/en/explore_hu/learning

- Timeline: https://www.hiroshima-u.ac.jp/en/explore_hu/timeline

- Support: https://www.hiroshima-u.ac.jp/en/explore_hu/support

- Life: https://www.hiroshima-u.ac.jp/en/explore_hu/life

- Photos: https://www.hiroshima-u.ac.jp/en/explore_hu/photo

- Videos: 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 was 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 that contains 15 diploma programs, Joint International Master's Program in Sustainable Development (Hiroshima University and Leipzig University)).

The Division of Advanced Science and Engineering was 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) 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. Furthermore, in 2021, (15) Smart Innovation Program has been newly provided to allow the university and industries to closely cooperate to promote research and development activities for social implementation and develop sophisticated human resources for the industries.

Features of the Program <https://www.hiroshima-u.ac.jp/en/tes>

Transportation and Environmental Systems Program

The Program conducts advanced research and specialized education on technologies related to the structures, fluid dynamics, and systems of transportation vehicles such as ships, automobiles, and aircraft. It also focuses on technologies for preserving and creating a sustainable global environment through the study of marine and atmospheric environments, as well as technologies that enable the harmonious coexistence of transportation systems and the Earth's environment.

Overview

Transportation systems play a vital role in realizing a highly sustainable and circular society that coexists with the global environment. As globalization continues to advance, there is an increasing demand from industry and society for engineers who can contribute to the development of vibrant global networks and address challenges related to transportation and environmental systems on a worldwide scale. To meet these needs, the Program aims to cultivate creative professionals who can work across national borders and contribute to engineering solutions for a globalized society.

Through education and research on transportation technologies, logistics systems, marine environments, and energy-related issues, students acquire the knowledge and skills necessary to analyze and solve transportation and environmental challenges from both technological (hardware) and systemic (software) perspectives. The Program seeks to develop highly qualified engineers and researchers capable of addressing global-scale issues related to transportation and environmental systems.

Graduates of the Program are expected to play leading roles as engineers and researchers in a wide range of sectors, including the automotive, maritime and ocean engineering, logistics, systems engineering, and environmental industries, as well as governmental and public organizations.

Key words

- Fluid Dynamics for Vehicle and Environmental Systems
- Marine Transportation System
- Airworthiness and Seakeeping for Vehicles
- Ocean-Atmosphere Systems
- Integrated Engineering for Vehicle and Environmental Systems
- Structural Systems
- Structural Design
- System Safety

Necessary Curriculum to Obtain the Degrees

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 their own 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 2026 academic year is attached. Students will choose subjects mainly from "Transportation and Environmental Systems Program".

(URL: https://momiji.hiroshima-u.ac.jp/syllabusHtml_en/2026_E90109_en.html)

List of faculty members capable of guiding JDS Fellows

<https://www.hiroshima-u.ac.jp/en/adse/staff/transportation-and-environmental-systems>

<https://www.hiroshima-u.ac.jp/en/tes/labo>

Students need to decide their own 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.

【Transportation and Environmental Systems Program】

*May 1, 2026

(Note) The following lists are current as of the above date, and include faculty members who may not be able to accept students due to retirement or other reasons at the time of admission.

Transportation and Environmental Systems Program

Specialty	Research Fields	Academic Staff
Structural Systems	Buckling and ultimate strength evaluations Fracture and fatigue strength evaluations Computational Mechanics, Applied Mechanics, Solid/Structural Analysis Research on a floating structure for offshore wind power generation Energy harvesting using mechanical vibration Nondestructive inspection, Numerical electromagnetic field analysis	KATAGIRI, Kazuaki (Concurrent post)
Structural Innovation	Research on novel structures and manufacturing technology and new materials (e.g., CFRP) for aerospace, ships, etc. Advancement of semiconductor device fabrication process Research on the deterioration/failure prediction of infrastructure Research on the mechanical properties and damage behavior of composite materials for aerospace structures Research on the methods for enhancing the strength and toughness of advanced composite materials	KATAGIRI, Kazuaki MOHAMMAD, Fikry
System Safety	Research on safety assessment and maintenance for structures and transportation equipment systems. Development of sensors for dynamic load and deformation measurement. Development of instrumentation system for structural safety management. Automatic control and planning of ship equipments and systems.	SHINTAKU, Eiji TANAKA, Yoshikazu

Transportation System Innovation	Research on planning and design methodology for transportation systems using ICT Design and planning of new transportation system using maritime logistics big data Development of efficient construction system using factory monitoring Ocean monitoring and observational physical oceanography Data assimilation and ocean environment prediction	HAMADA, Kunihiro TANIGUCHI, Naokazu
Ocean Sensing	Research on the remote sensing technology for marine environment Research on the sensing technology for maritime transportation	SAKUNO, Yuji
Fluid Dynamics for Transportation and Environmental Systems	Research on the reduction of wind resistance acting on a bridge of ship Research on seakeeping performance of a ship in nonlinear wave Research on aerodynamics of an automobile in the real world Assessment and prediction of ocean-atmosphere environment due to vehicle transportation Research on an advanced technology of electrical energy generated by renewable energy (wind, ocean power, vibration) Research on a technology of energy harvesting Research on CFD technology by using Particle Based Method	MUTSUDA, Hidemi NAKASHIMA, Takuji
Air Transportation and Ocean Systems	Research on the aerodynamic properties of WIG flying over the waves Research on the passive control of the wind turbine with elastic composit material Research on the human-powered aircraft Theoretical and experimental researches on Ship seakeeping Ship weather routing with forecast uncertainty Route optimization using NWP models and AI Ship behavior analysis using AIS and environmental data	IWASHITA, Hidetsugu CHEN, Chen
Ship Design Innovation	Development of an environment friendly marine vehicle Research on prediction of performances of marine vehicle Research on marine navigation safety Research on a new energy transportation	HAMADA, Kunihiro (Concurrent post) Yasukawa, Hironori (Collaborative Research Laboratory)

Academic Schedule

(Reference)

Fall Semester (October 1 - March 31) <In case of the schedule in AY2026>

October 1	Entrance Ceremony, Orientation
October 2 - February 8	Classes
Early October	International Student Orientation (University-wide)
Mid October	Deadline of Class Registration
December 26 - January 5	Winter Vacation
February 9 - March 31	End-of- Academic-Year Holidays

Spring Semester (April 1 - September 30) <In case of the schedule in AY2027>

April 1 - April 7	Spring Vacation
April 8 - August 4	Classes
Mid April	Deadline of Class Registration
July	Thesis Submission
August	Thesis Defense
August 5 - September 30	Summer Vacation
September 17	Graduation Ceremony

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

Residence

We provide apartments for international students at a reasonable rent. Students can get support in English from Hiroshima University Co-op when they apply for the apartments.

Also, a public apartment called "Sun Square Higashi-Hiroshima" is available to international students.

Library

JDS fellows have full access to 5 other libraries on campus which has approximately 3,400,000 materials in its collection. Holding a huge collection of books and electronic journals, with a total combined area of 26,000 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 and a barber shop. Hiroshima University also has a post office and a university health service center on the campus. Health Service 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 require 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.

The Transportation and Environmental Systems Program aims to contribute to the international society by comprehensively solving technical problems regarding the transport equipment and distribution system from a broad point of view regarding the global environment protection, developing and establishing technology that contribute to the sustainable development of society, and developing human resources who can be engaged in such processes.

The program develops highly qualified professionals who can create and establish a system for coexistence in which artificial objects such as transport equipment and the natural environment coexist in harmony on the basis of a wide range of basic and applied knowledge regarding the transportation system engineering and environmental system engineering, and comprehensively solve social problems or conduct advanced research while promoting mutual understanding with the other area of expertise.

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