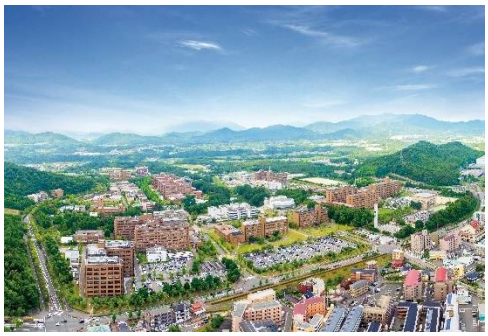
## *Hiroshima University (National)*
## *Graduate School of Innovation and Practice for Smart Society*



◆ **Program name**
Research Area: Smart Mobility, Smart Energy, Smart Agriculture, Global Health and Medical Science, Social Innovation Science

◆ **Degrees:**
Master of Philosophy

◆ **Credit and years needed for graduation:**
30 credits, 2 years

◆ **Address:**
1-5-1 Kagamiyama, Higashi-Hiroshima-shi, Hiroshima, 739-8529, Japan

## *Features of the 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 2025, HU has over 15,000 students including approximately 1,900 international students from about 95 different countries.
For details about education and student life at Hiroshima University, please visit the following websites.

- Education and Student 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 the Graduate School* https://www.hiroshima-u.ac.jp/en/smart_society

In April 2023, Hiroshima University launched a new graduate degree program, the Graduate School of Innovation and Practice for Smart Society, to foster human resources who can design, develop, and implement systems and technologies to achieve a smart society to flexibly respond to social issues among diverse human societies from the range of the entire earth to local communities.

●Integrated Knowledge of Learning and Practice
- A degree that balances interdisciplinary expertise.
- Participation of many leaders and institutions with practical experience from international industries, governments and academia.

●Supervision to Realize Interdisciplinary Education and Research

- Supervisors from multiple disciplines from four graduate schools give students advice on how to promote interdisciplinary perspectives in six cross-disciplinary research areas to realize a Smart Society.

●Educational Modules Designed for Flexible Learning
- Students can choose their subjects systematically from given modules based on their own strengths and specialties to foster integrated knowledge and practical knowledge.

## *Features of the Program* https://www.hiroshima-u.ac.jp/en/smart_society/main-fields

Education and research at the Graduate School of Innovation and Practice for Smart Society is centered on the six areas of research that have been highlighted as the main research fields for Society 5.0: Cyber Physical System, Smart Mobility, Smart Energy, Smart Agriculture, Global Health and Medical Science, and Social Innovation Science. JDS candidates can apply for one of the following five areas of these six areas above:

**(1) Smart Mobility**
This research area analyzes AI big data that combines various spatiotemporal real-time information transmitted and collected from moving objects, ranging from cars and public transportation to pedestrians, as well as historical data on driving behavior, traffic jams, CO2 emissions, accidents, and disasters. It also examines systems and planning for mobility associated with socially optimal solutions for regional economic development and quality of life improvements.
Through interdisciplinary collaboration with other research fields, this research area addresses topics related to practical scientific approaches, including MaaS system development in collaboration with regional medical care, operating sustainable modes of transportation using biofuels, and the development of methods for achieving consensus in policymaking based on traffic flow simulations.

**(2) Smart Energy**
This research area covers energy control and planning that can generate socially optimal solutions with the aim of improving regional economic development and quality of life, by improving the efficiency of energy usage systems, converting and storing fluctuating energy, effectively using biomass energy, and understanding energy and environmental issues from a social science perspective, in order to achieve carbon neutrality in terms of energy use.
Through interdisciplinary collaboration with other research fields, this research area addresses topics related to practical scientific approaches, including the development of energy fluctuation absorption systems linked with MaaS systems by electric vehicles, local systems for production and consumption of nitrogen fertilizers linked with solar sharing, and the development of methods for achieving consensus in policymaking based on low environmental impact energy use simulations.

**(3) Smart Agriculture**
This research area deploys mechanical engineering and robotics technologies to devise new technological systems for food resources, centered on biology and environmental science that incorporates sensors and analytics through information and AI technology. Research in this area specifically develops technologies to facilitate real-time monitoring of livestock and crops in agricultural production, and to increase the production of livestock and crops based on that information. In the context of fisheries, this will involve research to facilitate the sustainable use of marine resources by monitoring and simulating both aquaculture and resource management. In the context of food products, research entails the development of safe food production and foods with health-improving properties.
In addition to the perspectives detailed above, adding socio-economic perspectives to the agricultural field will enable researchers to engage with research topics that can contribute to a vertically integrated understanding of food resources and resolve issues related to sustainable global food production.

**(4) Global Health and Medical Science**
**This research area work examines topics in international medical health related to the concept of Society 5.0 and rooted in the "healthy lives and wellbeing for all" SDG, through collaborations with other research fields.**
**This research area engages in regional issues with a global perspective, is based on the most recent trends in science and technology, and examines research topics that can contribute to the realization of smart societies, including new medical and health-related policies in other countries, telemedicine and remote rehabilitation using ICT, rehabilitation using robotics based on engineering methodologies, and the use of**

**robotics in social care.**

**(5) Social Innovation Science**

This research area includes new policymaking, development, implementation, analysis, and evaluation backed by evidence-based policymaking to ensure social innovation, and the implementation of governance on the basis of that research. Research in this area seeks to leverage smart solutions and digital information analysis technologies, such as AI and machine learning, as researchers acquire expertise in immediate and quantitative decision-making science-based methodologies.

This research area addresses topics related to practical science with a strong connection to social innovation, through interdisciplinary collaboration with other research fields and through seeking to change human behavior relating to energy selection and consumption, food resource management, climate action, and health maintenance and promotion. For developing a research plan relevant to this research area please refer to https://econdev.hiroshima-u.ac.jp/wp/?page_id=441.

## *Necessary Curriculum to Obtain the Degrees*

https://www.hiroshima-u.ac.jp/en/smart_society/curriculum

To obtain a Master's degree, JDS Fellows need to satisfy the following requirements:
(1) Minimum of 30 credits through program work;
(2) Submission of a master's thesis.
All students need to choose a 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 to be offered in the 2026 academic year is attached. After enrolment, students are required to take courses according to their research topics in consultation with their supervisor.
(URL: https://momiji.hiroshima-u.ac.jp/syllabusHtml_en/2026_EE_en.html)

## *List of Faculty Members Capable of Guiding JDS Fellows*

https://www.hiroshima-u.ac.jp/en/smart_society/faculty

Students need to choose 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.

**【Smart Mobility】**

| Position | Name | Research Subject |
|---|---|---|
| Professor | FENG, Tao | Urban planning, smart mobility, travel behavior, transport network analysis, data driven technology, mobility in built environment, spatial planning, urban environment analysis, decision making in smart energy, big data & machine learning for urban research |
| Professor | CHIKARAISHI, Makoto | Smart urban infrastructure, transportation planning, urban planning, travel behavior analysis, travel survey design, transport network analysis, resilience research, risk analysis |

**【Smart Energy】**

| Position | Name | Research Subject |
|---|---|---|
| Professor | ICHIKAWA, Takayuki | Research and development of energy conversion materials which are in particular related to: Secondary battery materials; Fuel cell with non-conventional mechanisms, energy conversion systems, and/or solid state hydrogen storage materials; Energy recovery from waste and biomass. |

| Position | Name | Research Subject |
|---|---|---|
| Professor | MATSUMURA, Yukihiko | Production of hydrogen from biomass using supercritical water; Heat transfer and chemical reactions in supercritical water; Hydrothermal pretreatment of biomass; Hydrothermal carbonization; Chemical heat pump; Application research of carbon nanotube. |
| Professor | KUBOTA, Tetsu | Building and urban environmental science for achieving sustainable development in developing world |
| Professor | LEE,Han Soo | Renewable energy resource (wind, solar and ocean energy) evaluation and management, Numerical models for coastal hazards, and disaster prevention and mitigation, Evaluation of climate changes impacts on natural hazards and renewable energy resources |
| Professor | MIYAOKA, Hiroki | Research on hydrogen production, hydrogen storage, ammonia synthesis, and material conversion based on functional properties of light elements.<br>Understanding reaction mechanism by original sample synthesis methods and various analyses from wide points of view. |

**【Smart Agriculture】**

| Position | Name | Research Subject |
|---|---|---|
| Professor | MARUYAMA, Fumito | Our research focuses on understanding how microorganisms interact with each other, with their symbiotic hosts and with the environment, both experimentally and through big data analysis. Topics includes the relationship between climate change and microbes, genomic dynamics of pathogenic microbes in habitats, and pathogenic microbes and antibiotic resistance in air and water environments. |
| Professor | TRAN, Dang Xuan | Development of biomass energy technologies and application to developing countries<br>Agricultural ecology and development of sustainable agricultural technologies |
| Professor | HOSAKA, Tetsuro | I have been working on the diversity and ecological functions of insects in various ecosystems including forests, agricultural lands, wetlands, and urban green spaces. Also, I am interested in the interactions between human and nature, such as nature-based tourism,<br>children's nature play and conflicts with wildlife, from the perspective of biodiversity conservation. |
| Associate Professor | WATANABE, Sonoko | Research and education on vegetation and landscape ecology of SATOYAMA ecosystems with a wide range of conservation issues.<br>-Geographic distribution patterns of rural landscapes<br>-Biodiversity conservation in SATOYAMA |
| Assistant Professor | NGUYEN, Van Thinh | My current research focuses on environmental pollution, particularly the occurrence, transport, and ecological risks of microplastics and heavy metals in soil systems. Simultaneously, I am developing innovative toxic element removal technologies—such as advanced biochar-based and iron-modified materials—to mitigate contamination, enhance remediation efficiency, and contribute to sustainable environmental management and circular resource utilization. |

**【Global Health and Medical Science】**

| Position | Name | Research Subject |
|---|---|---|
| Professor | KASHIMA, Saori | "Environmental Health Science Research" on environmental factors and human health, and "Environmental Epidemiological Research" for engaging "Planetary Health" |

**【Social Innovation Science】**

| Position | Name | Research Subject |
|---|---|---|
| Professor | KANEKO, Shinji | Study on Sustainable Development for Developing Countries<br>Environmental Policy Studies in Asia |
| Professor | TAKAHASHI, Yoshi | Human Resource Development / Management, Management of Technology, Management of Small and Medium-sized Enterprises |
| Professor | SHARIFI, Ayyoob | Urban Planning and Policy Development, Environmental Planning and Management,<br>Climate Policy, Smart City, Sustainable Cities |
| Professor | KUSAKABE, Tatsuya | Comparative study of relationship between social, economic structure fluctuation and education in developing countries |
| Associate Professor | JOSHI, Niraj Prakash | Agricultural Economics, Farming under Changing Climate, Adoption of Innovative Farm Practices, and Poverty and Rural Development in Developing Countries |
| Associate Professor | SIMANGAN, Dahlia Collado | International Relations Theory, Peace and Conflict Studies, environmental peacebuilding, the peace-sustainability nexus |
| Associate Professor | KONDO, Masayuki | Evaluation of climate change countermeasures, analysis of greenhouse gas dynamics, land use change research in tropical regions, and theoretical research on Earth's climate regulation. |
| Associate Professor | CARO-BURNETT Johann | Political economy, voting behavior, international agreements, peace and conflict<br>Behavioral economics, experimental economics, development economics |
| Associate Professor | CHEN, Shuning | Assessment of sustainable growth and welfare (with Inclusive Wealth accounting), Development economics: integrating resource use and environmental policy, Environmental and resource economics: sustainability and policy evaluation. |
| Associate Professor | SAKATA, Nozomi | Comparative and International Education, Pedagogy and Learning, Education Policy Analysis, Sub-Saharan Africa, Low- and Middle-Income Countries |
| Associate Professor | KHAN, Ghulam Dastgir | Social and Economic Impact Assessment of Development Policies. |
| Assistant Professor | SAIJO, Harunobu | Comparative Politics, Historical Political Economy, Authoritarian Politics |

| Position | Name | Research Subject |
|---|---|---|
| Assistant Professor | MITCHELL, Austin Michael | Democracy and dictatorship, government budgets and finance, political economy of development, peace and conflict |

Note: List of Members" is subject to change due to personnel changes. In this case, you will be informed via the HP of Graduate School of Innovation and Practice for Smart Society.

## *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 |
| November 5 | University Anniversary Day |
| December 28 - 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 AY2026>**

| | |
|---|---|
| April 1 - April 7 | Spring Vacation |
| April 8 - August 4 | Classes |
| Mid-April | Deadline of Class Registration |
| End of July | Thesis Submission |
| Early August | Thesis Defense |
| August 5 - September 30 | Summer Vacation |
| September 18 | 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, have troubles and so on.

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

**Library**

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

The "World Bank Information Kiosk" is placed for the purpose of introducing active discussions in academic areas

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 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 cafeterias, a travel agency office, stores, book shops and a barber shop. Hiroshima University also has a post office and university health service center on the campus. The International Center provides mental counseling services to international students in English.

## *Message for Applicants*

Japan has an excellent track record in the technologies and operations that make up social infrastructure, including railroads, airports, water and sewage systems, telecommunications, and cyber technologies.
A safe, secure, and peaceful society is also a hallmark of Japanese society.
Society 5.0 is the future sustainable society that Japan is aiming for.
The Graduate School of Innovation and Practice for Smart Society was newly established for the purpose of education, research, and human resource development to realize the vision of Society 5.0, and to share it with the world.
Due to the strong demand for human resource development to achieve this goal in today's global society, there are high expectations for the new graduate program, and it has received offers of collaboration and participation from stakeholders in various fields.
We look forward to receiving applications for admission from anyone around the world that is interested in joining us.