Introduction to the Programs

Spintronics (GP-Spin)

The goal of GP-Spin is to produce doctoral students with strong academic and international skills, as well as the translational aspects of data science. It is conducted by the Graduate School of Information Sciences in cooperation with the Graduate Schools of Engineering, Economics, and Management, Life Sciences, Medicine, and Science (Mathematics). The students join the program in their 2nd year of the master course and work for the doctoral degree under the joint supervision of dual mentors in the partner universities. The program consists of data science subjects, training in big data analysis, big data challenges, and long-term collaborative research with the partner university.

Data Science (GP-DS)

The graduate program of Data Science provides an integrated education/research environment in which the students can learn the foundations of data science, such as analytics and computer science, as well as the translational aspects of data science. It is conducted by the Graduate School of Information Sciences in cooperation with the Graduate Schools of Engineering, Economics, and Management, Life Sciences, Medicine, and Science (Mathematics). The students join the program in their 2nd year of the master course and work for the doctoral degree under the joint supervision of dual mentors in the partner universities. The program consists of data science subjects, training in big data analysis, big data challenges, and long-term collaborative research with the partner university.

Physics for the Universe (GP-PU)

The research and educational field of GP-PU broadly covers physics related to the Universe, i.e., elementary particle physics, nuclear physics, astronomy and cosmology. The educational program contains actual practice using cutting-edge devices and systems developed alongside the construction of large scale high energy and nuclear experiments, in which Tohoku University is deeply involved. It also nurtures academic leadership with a series of hot-topic seminars followed by facilitated discussions.

Science of Safety and Security for Human and Society

The issues of safety and security have become more important in the world. We aim to develop cutting-edge education programs for top leaders in global safety sciences for humans and society through understanding mechanisms that generate disasters risk, and their various associated dangers. Leaders should contribute to safety and security against natural disasters, human induced disasters, disputes, and cyber security. The program cultivates human resources, with discipline in their studies and clear decision-making skills, based on true knowledge derived from academic research, who will make a better future.

Japanese Studies

The goals of this graduate program can be summarized in the following 3 points.
1. To take up issues such as “conflict resolution” and “sustainability” that have become urgent issues in contemporary society and to further the development of multidisciplinary, pluralistic, and innovative “Japanese Studies.”
2. To propose solutions to contemporary social issues based on “empathy” and “harmony” and to pursue policies that can bring about well-being.
3. In implementing goals 1. and 2. above, to train leaders who can be active in international society and who will make broad scholarly accomplishments.

Integration of Mechanical Systems (GP-Mech)

The graduate program for Integration of Mechanical Systems develops a multi-disciplinary study including robotics and aerospace engineering. These subjects require the integration of various knowledge bases and an insight on mechanical systems. Continuing on with our activities toward globalization, the program offers an international education and research environment and the opportunity to work on the cutting edge technology in the world. This environment fosters our researchers and engineers to lead global innovation by designing and implementing integrated mechanical systems that work for challenging applications.
Tohoku University Joint Education Programs Comparison

**Jointly Supervised Degree**
- Degree from home univ. + Joint Certificate from both univs.
- Joint Thesis Examination

**Double Degree**
- Degree from home univ. + Degree from host univ.
- Joint Thesis Examination(s)

**Joint Degree**
- One Degree from both univs.
- Joint Thesis Examination

**Educational Program**
- Participating Graduate Schools
  - Arts and Letters
  - Science
  - Engineering
  - Agriculture
  - Information Sciences
  - Environmental Studies
  - Biomedical Engineering
  - Pharmaceutical Sciences
  - Life Sciences

- Partner Universities
  - Johannes Gutenberg-Universität Mainz
  - University of Bayreuth
  - Case Western Reserve University
  - University of Regensburg
  - University of Hawaii

**Degree Conferment**
- Thesis defense
  - D3
  - D2
  - D1
- Cooperation research
- QE* (Qualification Exam)
- Summer/Winter School
- M2

Curriculum Example (Spintronics (GP-Spin))

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*Qualification Exam (QE)*
At the end of the second year of the Master’s program, students are to take the QE to be assessed whether they have fulfilled the requirements to start their doctoral research.

Degree from home univ.
Joint Certificate from both univs.
Degree from home univ.
Degree from host univ.
One Degree from both univs.