August 27, 2020
Gunma University
Subaru Corporation

Gunma University and SUBARU Set Up Joint Research Course:
"Next-Generation Automobile Technology Research Course"

Gunma University (Maebashi-shi, Gunma; President: Hiroshi Hiratsuka) and Subaru Corporation (Shibuya-ku, Tokyo; President and CEO: Tomomi Nakamura) set up a joint research course titled the "Next-Generation Automobile Technology Research Course" at the School of Science and Technology of Gunma University on April 1, 2020 and held an inauguration ceremony at the university's Ota Campus (Ota-shi, Gunma) on August 7. A joint briefing about the new course was held at the Gunma Prefectural Office (Maebashi-shi, Gunma) today on August 27.

Subaru has long provided "enjoyment and peace of mind" to customers by "building human-centered cars." In order to make manufacturing cars with a pursuit of "enjoyment and peace of mind" an even more achievable goal, Subaru has set a target of "zero fatal road accidents* in 2030" and is furthering R&D to that end. (* Zero fatal road accidents among occupants of Subaru vehicles and people collided with Subaru vehicles including pedestrians and cyclists.)

The "Next-Generation Automobile Technology Research Course" (hereinafter, "the course") has set 2030 as a midway point, and Gunma University and Subaru will coordinate on making the course an "innovation base" for the creation of automobile technologies that will be demanded in the future.

In this course, R&D for creating new value for cars will be done in the pursuit of "cars that bring about enjoyable lives with more smiles and more peace of mind." A Gunma University-SUBARU model of an industry-academia collaboration platform will also be formed with the course at its core. This original platform will be joined by startups, local companies, and the like, promote collaboration with other research organizations, and include human resources development for students, researchers, and working people, as well as making social contributions. The course will also integrate joint research projects previously carried out individually, bring together Gunma University's knowledge resources in the areas of science and technology, medicine, health sciences, and informatics, and support a framework for Gunma University and Subaru to pursue efforts to solve the company's research issues in a strategic, comprehensive, and organized manner.

The three years from 2020 to 2023 will be positioned as the "first phase: building a foundation for activities," and efforts will start in the areas of Safety, Human Augmentation, and Design Process Improvement as shown below.

1. **Safety**
   We will aim to go beyond the target of zero fatal road accidents to achieve the ultimate goal of no road accidents at all. Interaction between people and cars and the desired connection of cars and the surrounding transport environment will be pursued to achieve "safer cars that avoid collisions." That will be done through application research such as that on next-generation advanced driving support vehicles equipped with various sensing functions/artificial intelligence and on vehicles equipped with

self-driving functions, and the results of that research will be applied to society.

2. **Human Augmentation**
   We will unravel why people feel “peace of mind” and “enjoyment” regarding cars from a medical and mind-body science related approach, linking the findings to engineering that can be designed. The mechanism by which the brains of vehicle occupants and transport users understand things will be explained by focusing on sight, hearing and balance by semicircular canals, and human sensory organs that feel vibration, pressure, and the like. And we will proceed with research to apply that to amplification and optimization of the human-augmenting senses held by cars and to vehicle control technologies, establishing them as next-generation technologies.

3. **Design Process Improvement**
   In developing processes and methods for efficiently performing tasks from design to evaluation and construction for all functions, performances, and qualities of a vehicle in virtual space from the initial stages of development, phenomena that mechanisms need to be clarified for and themes where development of analysis, evaluation, prediction methods, and the like is needed will be selected, and research will be performed for those.

Left: Hiroshi Hiratsuka, President, Gunma University
Right: Tetsuo Fujinuki, Vice President, Subaru Corporation

■ History and background

A collaboration system with graduate school collaborative courses, joint research, and the like was built after a comprehensive agreement was concluded between the Gunma Plant of Fuji Heavy Industries, Ltd. (now Subaru Corporation) and Gunma University in 2005. Based on the results of collaboration up to now, the joint research course was set up in order to be a joint research structure that can comprehensively respond more quickly and flexibly in line with societal changes and technical advancements and in order to develop educational programs based on the needs of society.

■ Overview

Name: Next-Generation Automobile Technology Research Course

Structure for efforts:	A structure that can contribute to education, research, and development across the university, including the Gunma University Graduate School of Science and Technology, Graduate School of Medicine, Graduate School of Health Sciences, and Faculty of Social and Information Studies, is built and a base for activities set up at the Ota Campus. Course faculty (specially-appointed professors) are dispatched from Subaru.
Term of operation:	April 1, 2020 to March 31, 2023 (tentative)

■ **Representative's comments**

Hiroshi Hiratsuka (President, Gunma University):

The joint research course with Subaru Corporation for research on next-generation automobile technology was set up with an aim of Gunma University researchers in areas such as science and technology, medicine, health sciences, and informatics and Subaru engineers coordinating in a comprehensive manner to perform joint research, working to solve issues and foster new related human resources. This differs from promoting individual instances of joint research done by matching the company's needs and seeds held by the university's researchers, as we have done up to now.

At the university, our faculty, graduate students, and undergraduate students participating in research will gain a practical opportunity to learn corporate thinking and the situation at the front lines in addition to proceeding with research for problem-solving. Corporate personnel will gain an opportunity to take a fresh look at technology from a new viewpoint based on academic knowledge. And this is expected to lead to overall stimulation of both organizations.

We will do our best for this joint research course to lead to the formation of a "Gunma model of new joint research" that supports abundant lives for many people including residents of Gunma, that achieves revolutionary results in research for producing automobiles where safety, peace of mind, and enjoyment are pursued, and that at the same time fosters related human resources.

Tetsuo Fujinuki (Vice President, Chief Technology Officer, Chief General Manager of Engineering Management Division and Technical Research Center, Subaru Corporation):

Efforts in research Subaru has continued to carry out with Gunma University up to now will proceed to a new phase as part of R&D on next-generation automobile technology that will bring smiles to customers. We will put efforts into making the joint research course set up this time an outside innovation base for creating new technologies and new value that clear the way to a post-CASE (connected, autonomous/automated, shared, and electric) era and for making secure and enjoyable cars and society that make people's day-to-day lives more amenity-rich. As part of Subaru's organizational reform and human resources development reform, we will foster research and education activities and personnel exchanges in the joint research course to stimulate internal organizations, engineers, and researchers, and will incorporate the course into our corporate institutions by securing positions as in-house researchers. We would also like to contribute to local society centering on Gunma Prefecture and university educational reform through coordination with local companies and other universities and through research activities and exchanges with undergraduate and graduate students and researchers.