Advanced Research Collaborative Laboratory

The lecturers at Toyohashi University of Technology collaborated with researchers from domestic and international research organizations that boast a high standard of research to establish the Advanced Research Collaborative Laboratory. The goal of this was to allow us to pursue research in a specific research field for a fixed period as well as improve the sophistication and variety of research here at our university.

RESEARCH ADMINISTRATION CENTER

■ Office for Research Strategy

- Analyses trends in academic research, scientific policies, society's needs, university potential in Japan and overseas, determines an overall research strategy and presents these ideas to the Strategic Planning Committee.
- Determines and implements programs for the continuous development of URAs (University Research Administrators).

■ Office for Promotion of Industry-Academia Collaboration

- Proposes policies for the further pursuit of interdisciplinary research to create new value with industry-academia-government at its core.
- Supports acquisition of competitive funding for projects with a large impact.
- Offers overall support from the creation to the acquisition of rights and applications of intellectual property, and supports collaborative activities involving intellectual property.
- Employs experts in international patents and international law to meet the global requirements concerning patents and contracts.

■ Office for Risk Management of industry-academia Collaboration

- Manages issues such as conflicts of interest, confidential information management and security export control in order to facilitate industry-academia collaboration.

■ Office for Technology Support Service

- Manages the university's shared equipment and provides support for interdisciplinary research by employing experts and lecturers with highly-specialized skills.

■ Office for OPERA Support Service

- Support the research program on OPERA (Open Innovation Platform with Enterprises,Research Institute and Academia) promoted by Japan Science and Technology Agency.

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(Research seeds)

TOYOHASHI UNIVERSITY OF TECHNOLOGY

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(RITI)

SUSTAINABLE DEVELOPMENT GOALS

Creating new value and revitalizing the community through research

Research Institute for Technological Science and Innovation (RITI)

Master technology, create technology

TOYOHASHI UNIVERSITY OF TECHNOLOGY

Outline of the Research Institute for Technological Science and Innovation (RITI)

Creating new value and Revitalizing the community through research

Toyohashi University of Technology was built on the philosophy that it will contribute to the development of mankind by discovering scientific principles that support the evolution of technology, the production of modern and innovative technology, and the creation of new value that leads us to the solutions of today's challenges and further into the future.

To put this philosophy into practice at a high level, we especially focus on developing the following:

1. Promotion of Emergent System Research for the creation of new values, which is evolving at a rapid pace and which incorporates TUT's strengths such as sensing, artificial intelligence, and robotics research
2. Promotion of Social System Research for solving problems, which can contribute to local communities
3. Promotion of Advanced Interdisciplinary Research through strong collaboration with leading companies and top research institutions both domestically and abroad

Therefore, we chose to combine our existing Electronics-Inspired Interdisciplinary Research Institute (EIIRIS) with the work of our four research centers, and established the Research Institute for Technological Science and Innovation (RITI) that aims towards achieving open innovation.

We have established three strategic research departments within the institute, and have also founded The Cooperative Project for Innovative Research which is composed of research topics that were selected by members of the school community.

Strategic Research

Emergent System Research Division	Social System Research Division	Advanced Research Division
Research that creates new value for social implementation	Research to solve the problems society and communities face	Globally cutting-edge research in specialized areas

Cooperative Project for Innovative Research

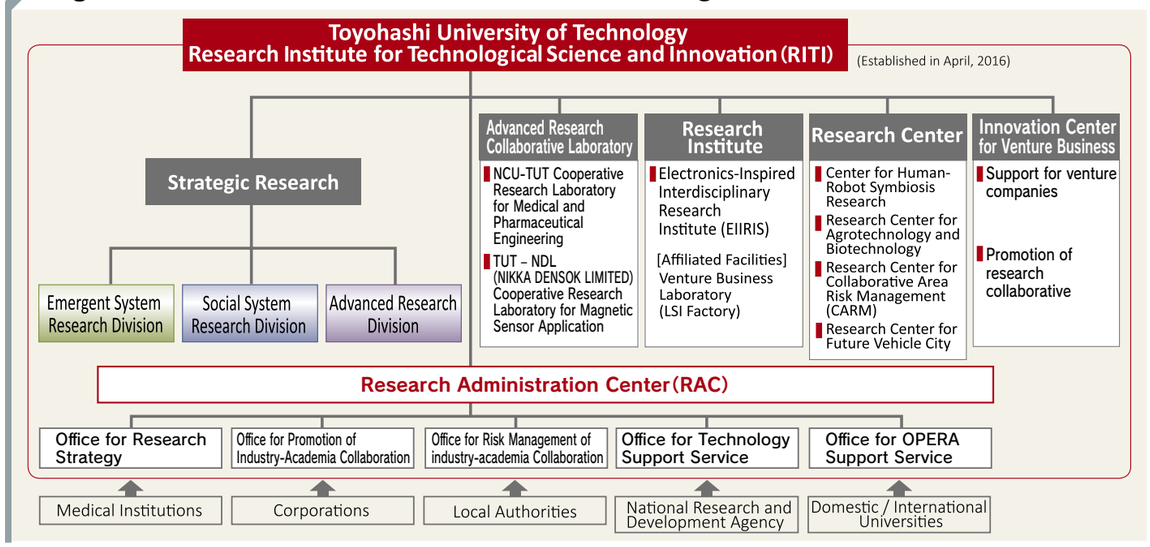
The "Cooperative Project for Innovative Research" is a project to promote effective interdisciplinary research. The project will develop the frontiers of specific fields using a matching fund format with domestic and overseas research institutions and companies; and will strengthen the ability of participants to implement and advocate for the results of research in society.

Main Research Policies

1. **Reinfocing the development of application and interdisciplinary research based on sensory,artificial intelligence and robotics research using the open application method***
2. **The creation of new, top global research fields**
3. **Reinforcement of research abilities through the Research Administration Center**
4. **Improving the research ability of all members of the faculty at the university to reinforce overall research capability**
5. **Establishment as an international base for science and technology**

*Open Application Method
This refers to pursuing interdisciplinary research aimed at actual application in society that makes maximum use of systems for open recruitment of research topics and open funding.

Organization Chart of Research Institute for Technological Science and Innovation (RITI)



Research Institute

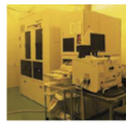
Electronics-Inspired Interdisciplinary Research Institute(EIIRIS)

Determined to become a world leader in development and interdisciplinary research

The Electronics-Inspired Interdisciplinary Research Institute (EIIRIS) was established in October 2010 as Toyohashi University of Technology's first research institute to explore the technological sciences and their applications. More specifically, EIIRIS's objectives are to develop interdisciplinary research of smart sensing, photonics information devices, and other innovative electronics technology and their advanced application in fields such as robotics, telecommunications, the life sciences, agricultural engineering, environmental science, and disaster prevention.

In April 2019, EIIRIS expanded its research structure from the existing two research disciplines to five, signaling the start of research and development in new interdisciplinary.

Venture Business Laboratory (LSI Factory)



Our LSI Factory, where you can learn everything there is to know about semiconductor integrated circuits

Our LSI Factory, where we do everything from design to the production and evaluation of semiconductor integrated circuits, has some of the world's best equipment. We are pursuing research and education into the development of integrated, intelligent devices, which combine semiconductor integrated circuits (IC, LSI) with sensor technology and nanotechnology.

Research Center

Center for Human-Robot Symbiosis Research

Toward a society where people and robots can coexist at high level and fruitefull lives, we are developing various type of service robots such as welfare robots that perform walk training and physical support, harvest support robots, intelligent lighting systems, etc. And we are conducting researches on human-robot symbiosis technologies based on the weak-robots concept, socally assistive robot technologies, and novel acutuators using ultrasonic motor.

Research Center for Agrotechnology and Biotechnology

This center was established for applying a range of our engineering technologies to agriculture. The center members, full-time specifically appointed professors as well as researchers in different departments, are collaborating and conducting research into agriculture, sensing systems, biotechnology, the environment, and smart agri-tech city systems.

We are also developing human resources for agriculture by conducting the following training courses: the Advanced Course for Managing Plant Factory, the Advanced Course for IT-based Land-utilizing Farming, and the Training Course for the Sixth Sector Industrialization, the Practical Course for Chrysanthemum and Tomato Cultivations, and the New Farmer Support Course (only in 2021), respectively.

Sensing technology

A plant farm that uses artificial light

Research Center for Collaborative Area Risk Management (CARM)

At our center,we conduct research into disaster prevention in the community and risk reduction in local areas by looking not just at natural disasters, but also at risks on a broader scale in the environment and everyday living. For this reason,we cooperate closely with local administrations,industries, and community groups,and through cross-collaboration with professors in related fields,we are endeavoring to develop technology and put our project aimed at reducing risk into practice.We are also striving to ensure the results of our research continue to benefit the community,and to establish a base for general academic research to contribute to creating a safe community full of vitality.

Research Center for Future Vehicle City

We are taking on the following research topics to create the sustainable vehicles of the future with a reduced carbon footprint:

1) Research into a city where low-carbon electric cars are the main form of transport
2) Research into a city which is safe and secure for vulnerable road users
3) Energy-saving technology and new systems that would support a low-carbon society

Wearable sensing for safe driving

Visualization of traffic big-data

Car detection for vulnerable road users

Self-driving car in action

Wireless electric vehicle

Innovation Center for Venture Business

It has been established for the purpose of utilizing the research results and human resources to support the start-up of a venture company, the research and development of commercialization after the start-up,and the promotion of joint research.

We are waiting for the use of everyone, such as companies.