

# GRADUATE SCHOOL OF ENGINEERING SCIENCE



# Greetings

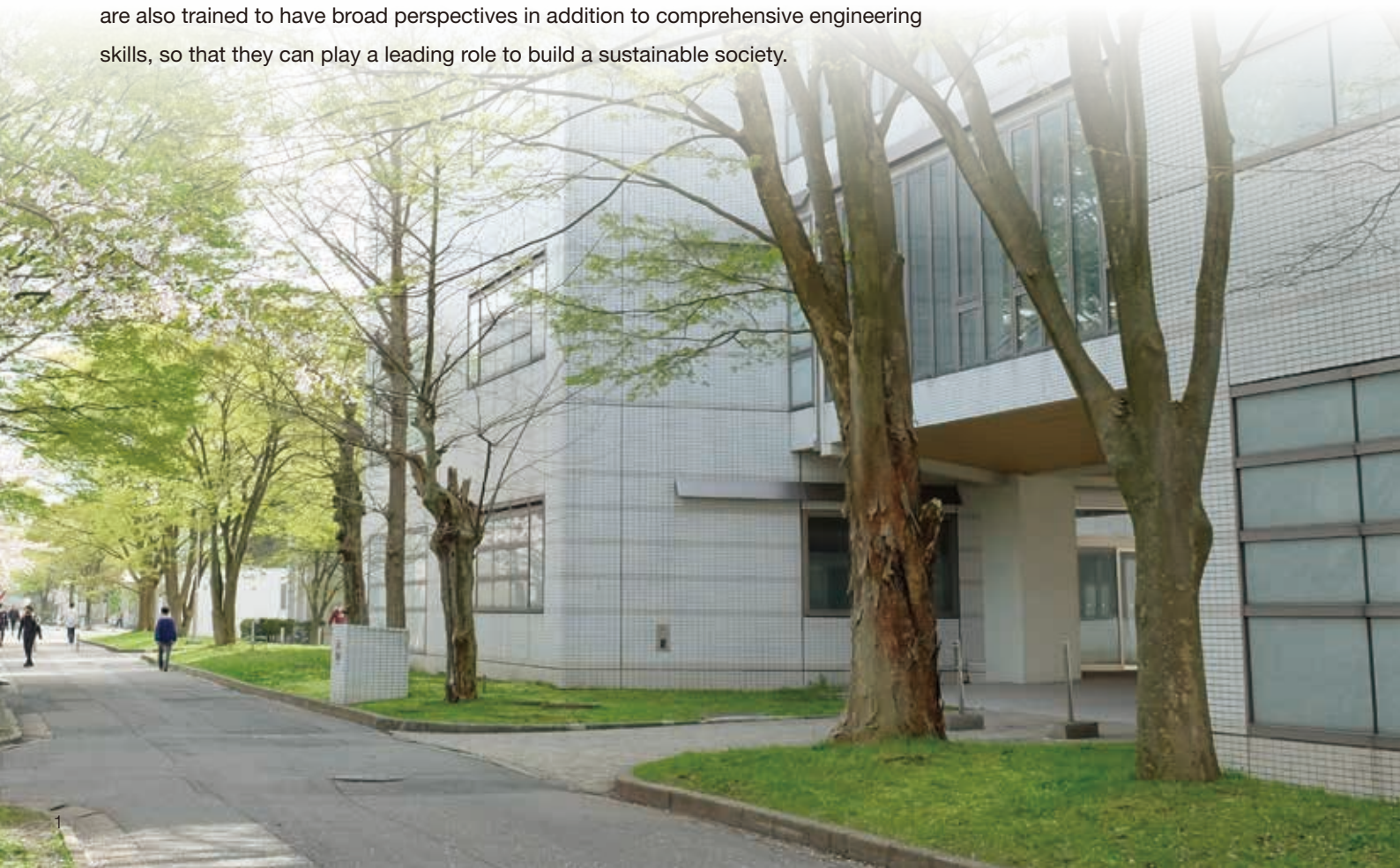
***Regional revitalization through strengthening scientific education.  
Educating and preparing students to deliver technological innovation in the global community.***

Global warming is a problem of global scale, and we are required to solve it through the progress of science and technology and to build a sustainable society. In Japan as well, the 2050 Carbon Neutral Declaration, which aims to reduce greenhouse gas emissions to zero for society as a whole by 2050, has been announced, and the goal is to aim for a decarbonized society. In order to achieve these goals, existing specialized approaches alone are not enough, and it is necessary to establish a new technology system with deep expertise and a broad perspective on other fields. Furthermore, in recent years, there have been remarkable advances in computer-based technologies such as big data processing, data-driven science, automation, and artificial intelligence. We need people who can find new breakthroughs by integrating existing specialized fields with these new digital technologies.

The Graduate School of Science and Engineering, Akita University develops education and research programs to develop human resources with engineering design skills that create new value by integrating multiple fields based on a solid foundation in each field. We have master's courses available in each of our five departments: life science, materials science, mathematical science and electrical-electronic-computer engineering, systems design engineering, and sustainable engineering, which is jointly managed with Akita Prefectural University. Our graduate students are required to take not only common-course and specialized classes but also minor-specialized classes through which they efficiently acquire wide-ranging technical knowledge and skills. Finally, doctoral degrees are the responsibility of the Department of Integrated Engineering Science. Its students, whilst naturally focusing on very specialized areas, are also trained to have broad perspectives in addition to comprehensive engineering skills, so that they can play a leading role to build a sustainable society.



***JIKEI Mitsutoshi***  
Dean of Graduate School of  
Engineering Science



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## Graduate School Organization

The Graduate School of Engineering Science consists of master's degree program and doctoral degree program.

### [Master's Degree Program]

The master's degree program consists of 5 departments as the below. The Department of Cooperative Major in Sustainable Engineering is the joint master's degree program between Akita University and Akita Prefectural University.

Department	Course
Life Science	Life Science
Materials Science	Applied Chemistry
	Materials Science and Engineering
Mathematical Science and Electrical- Electronic-Computer Engineering	Mathematical Science
	Electrical and Electronic Engineering
	Human-Centered Computing
Systems Design Engineering	Mechanical Engineering
	Civil and Environmental Engineering
Cooperative Major in Sustainable Engineering	Electromobility
	Social Environment System

### [Doctral Degree Program]

The doctoral degree program has one department which includes all research field of the master's degree above.

Department	Field
Integrated Engineering Science	Life Science
	Materials Science
	Mathematical Science and Electrical- Electronic-Computer Engineering
	Systems Design Engineering

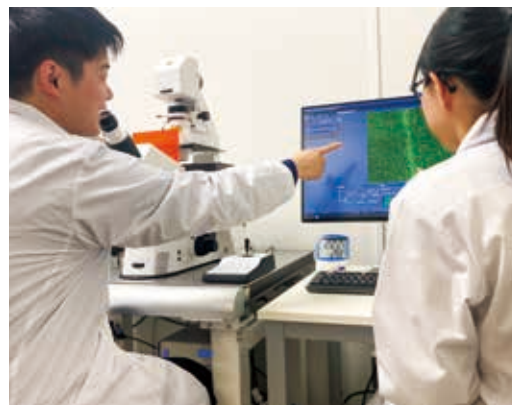
The doctoral degree program offers courses in English for international students.

### ●Cooperative master's degree program with the Graduate School of Medicine

Graduate School of Advanced Healthcare Engineering

# Life Science Course

Life Science Course consists of the fields of biology and chemistry, each of which conducts scientific research on the problems of life science from a different point of view. Graduate students in Life Science Course specialize in biology or chemistry and acquire special knowledge and skills by performing laboratory work. The students are also broadened their outlook and strengthen their mind of cooperation by taking classes of both fields and discussing scientific problems with students and teachers of different laboratories. Life Science Course trains skillful scientific researchers and engineers.



[https://www.riko.akita-u.ac.jp/en/intro/courses/life\\_sciences.html](https://www.riko.akita-u.ac.jp/en/intro/courses/life_sciences.html)

## Chemistry and Chemical Biology

Biomolecular Chemistry field covers the areas including structural biology, protein chemistry, analytical chemistry, supramolecular chemistry, and organic chemistry.

Name	Title	Research Theme
Fujiwara Kenshu <small>*This Professor is going to be retired in March 2028.</small>	Prof.	Total synthesis of bioactive natural products and development of synthetic, biofunctional molecules
Odaka Masafumi	Prof.	Structural and functional studies on medically and industrially important proteins
Kondo Yoshihiko	Associate Prof.	Supramolecular chemistry based on macrocyclic compounds
Matsumura Hirotooshi	Associate Prof.	Studies on structure-function relationships within proteins for understanding mechanism of action of drugs

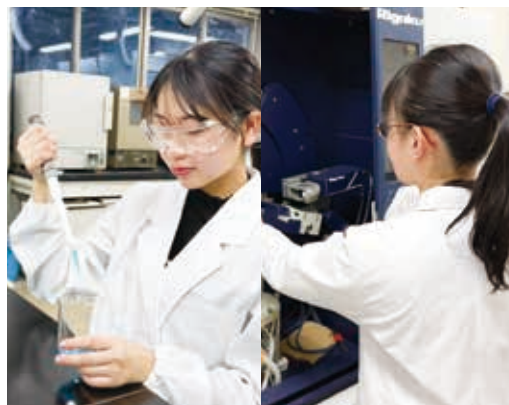
## Molecular Cell Biology

Molecular Cell Biology field covers areas such as biochemistry, molecular biology, cell biology, and disease biology.

Name	Title	Research Theme
Hikida Masaki	Prof.	Study for regulatory mechanism of memory B cell activation
Kubota Hiroshi <small>*This Professor is going to be retired in March 2028.</small>	Prof.	Study for neurodegenerative disease and protein aggregation (as an educational theme)
Yamazaki Masakazu	Prof.	Molecular mechanisms of planar cell polarity
Yamagata Nobuhiro	Associate Prof.	Neuroscience of likes and dislikes
Fujita Kaori	Lecturer	Biological functions of p53 and its isoforms in cellular senescence and aging-associated diseases

# Applied Chemistry Course

The Applied Chemistry Course curriculum provides the knowledge and skills necessary to use atomic- and molecular-scale material design and synthesis to provide creative manufacturing solutions for society. After finishing our course, graduates will be able to contribute to the development of environmentally friendly manufacturing and advanced chemical technologies, such as the development of new functional materials, the effective use of chemical energy in recycling, and the advanced use of bio-derived functionality in products.



[https://www.riko.akita-u.ac.jp/en/intro/courses/applied\\_chemistry.html](https://www.riko.akita-u.ac.jp/en/intro/courses/applied_chemistry.html)

## Chemistry of Organic Materials

Synthesis and Properties of Organic Functional Materials

Name	Title	Research Theme
Jikei Mitsutoshi	Prof.	Synthesis and properties of functional macromolecules
Matsumoto Kazuya	Associate Prof.	Synthesis and applications of functionalized organic materials
Yamada Manabu	Associate Prof.	Development of new molecules for separation of hard-to-separate organic compounds and precious metals

## Applied Physical Chemistry

Design and Application of Environmental Advanced Materials from the Viewpoint of Physical Chemistry

Name	Title	Research Theme
Murakami Kenji	Prof.	Development of carbon resources conversion catalyst and synthesis of new inorganic-organic composites
Inoue Yukihiro <small>*This Lecturer is going to be retired in March 2028.</small>	Lecturer	Chemistry about organic reactions and functional polymers
Nakamura Ayano	Lecturer	Development of functional materials with stimuli-responsive polymer

## Inorganic Materials Chemistry

Synthesis and Characterization of Inorganic Advanced Materials such as Porous Material, Catalytic Materials and Ceramics

Name	Title	Research Theme
Kato Sumio	Prof.	Studies on synthesis of complex metal oxides and application to materials for environmental purification
Ogasawara Masataka	Associate Prof.	Studies on preparation of functionalized porous material and inorganic-organic composite
Saito Kanji	Lecturer	Materials design using a low-dimensional nanospace of inorganic solids

## Energy Chemical Engineering

Process Design of Heterogeneous Reaction for Efficient Utilization of Energy and Resources

Name	Title	Research Theme
Okawa Hirokazu	Prof.	Application of sonochemical reaction for the synthesis of battery materials and environmental purification materials
Kato Takahiro	Associate Prof.	Effective utilization of energy resources and design of functional materials

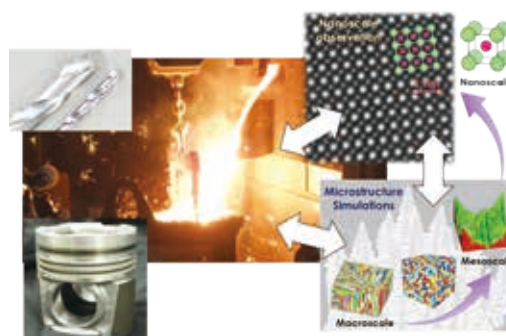
## Bioprocess Engineering

Education and research focusing on the analysis, design, and advancement of biochemical engineering-based bioprocesses and their practical application in society.

Name	Title	Research Theme
Horiguchi Ikki	Associate Prof.	Research on Cell Culture Process Design Methods and Related Technologies Integrating Experimentation and Computation

# Materials Science and Engineering Course

Our master's course goal is to develop the skills in our students needed to create new materials and develop new functional properties of materials. The course is based on fundamental physics and chemistry, and focuses on metals, semiconductors and ceramics. Our course curriculum gives students the opportunity to learn a broad range of advanced knowledge and skills efficiently on the microscopic nature of material properties and structures, as well as computer simulation techniques for predicting their macroscopic properties. After completing the course, students will be professionally able to contribute to the development of next generation materials that will contribute to, and be in harmony with human society.



[https://www.riko.akita-u.ac.jp/en/intro/courses/materials\\_science.html](https://www.riko.akita-u.ac.jp/en/intro/courses/materials_science.html)

## Material Creation Group

The physical and chemical properties of metallic materials vary greatly depending on their constituent atoms and structure, as well as manufacturing methods and heat treatment. The aim of this division is to investigate the mechanisms behind the physical and chemical properties of various materials based on microstructural analysis and simulation at the nanoscale and micron scale, and to develop new materials with new or improved functions.

Name	Title	Research Theme
Saito Kaichi	Prof.	Microstructure control of alloys and development of new materials by advanced electron microscopy
Hayashi Shigeo <small>*This Professor is going to be retired in March 2028.</small>	Prof.	Study on the structural and functional control of environmental ceramic materials
Natsume Yukinobu	Prof.	Development of numerical simulation model to predict the solidification structures for alloys
So Yeong-Gi	Associate Prof.	The atomic structure and physical properties of metals and alloys
Hasegawa Takashi	Associate Prof.	Development of advanced magnetic materials by sputtering method and nanotechnology
Kawano Naoki	Associate Prof.	Development of phosphor materials for radiation detection
Tsujiuchi Yutaka	Lecturer	Development of molecular electronics device using organic molecules and semiconductor

## Material Function Group

The development of functional materials which efficiently use resources and improve energy efficiency needs detailed investigation of the physical and chemical properties of materials. This division focuses on education and research aimed at the creation of innovative and practical materials production technologies, with a particular focus on materials that can withstand harsh operating conditions and increase the life and reliability of industrial products, such as high-strength, high-durability materials and high-performance electrochemical materials.

Name	Title	Research Theme
Ohguchi Ken-ichi	Prof.	Numerical and experimental study on constitutive modeling for materials
Yoshimura Satoru	Prof.	Development of high functional multiferroic thin films for novel magnetic devices driven by electric field
Nino Akihiro	Associate Prof.	Development of structural ceramics with superior mechanical properties
Fukumoto Michihisa	Associate Prof.	Research on high temperature oxidation behavior of heat resistant material and development of oxidation resistant surface
Goto Ikuzo	Associate Prof.	Research on higher-performance castings
Takahashi Hiroki	Associate Prof.	Development of electrode materials for fuel cells and electrolytic process such as CO <sub>2</sub> reduction and oxygen evolution reaction
Fukuchi Kohei	Lecturer	Study on the development of metal matrix composites and evaluation of the material properties

# Mathematical Science Course

Our focus is education and research on advanced mathematical concepts and structures in classical domains, such as algebra, geometry, and analysis, as well as elucidation and exploration of mathematical structures of various physical phenomena.

Along with the systematic nature of the curriculum, the main emphasis is on the interplay with adjacent fields such as computer science, and the acquisition of logical thinking ability, problem-modeling and problem-solving skills.



[https://www.riko.akita-u.ac.jp/en/intro/courses/mathematical\\_science.html](https://www.riko.akita-u.ac.jp/en/intro/courses/mathematical_science.html)

## Algebra, Discrete Mathematics and Computer Science

We study algebraic structures such as groups, rings, and fields, the combinatorics of discrete structures such as words and graphs, and theoretical computer science topics such as algorithms, computational complexity, and mathematical logic.

Name	Title	Research Theme
Yamamura Akihiro <small>*This Professor is going to be retired in March 2028.</small>	Prof.	Combinatorial group and semigroup theory, combinatorial designs, cryptology and information security
Fazekas Szilard Zsolt	Associate Prof.	New computational models, automata theory, combinatorics of strings and languages

## Geometry, Topology and Analysis

Our group focuses on the rich world of continuously changing objects. We study the shape and additional structure of curves, curved surfaces, and their higher-dimensional versions (geometric field). We are also interested in a theoretical analysis of the Boltzmann equation, which describes transport phenomena such as heat conduction and diffusion in gases.

Name	Title	Research Theme
Kobayashi Mahito	Associate Prof.	Theory and application of shape analysis by mappings.
Deng Dingqun	Associate Prof.	Cauchy problem on Boltzmann equation, Relativistic Boltzmann Equation in General Relativity
Nakae Yasuharu	Lecturer	Low-dimensional topology, especially foliation theory in 3-dimensional manifolds

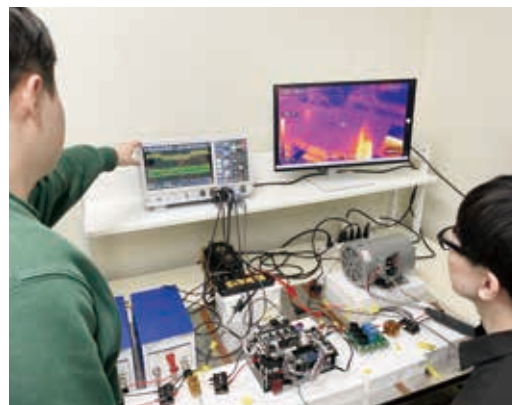
## Theoretical Physics

Research subjects of theoretical physics are quite diverse, covering topics from elementary particles and nuclei, various groups of materials consisting of atoms and molecules, to the universe. Students can learn how to construct mathematical models that extract and abstract the characteristics of actual physical systems and the phenomena they exhibit, as well as mathematical and numerical methods for analyzing those models.

Name	Title	Research Theme
Onoda Masaru	Prof.	Theoretical study of geometric phase effects in quantum wave propagation
Kuno Yoshihito	Associate Prof.	Theoretical study of quantum information scrambling, quantum many-body physics, and quantum simulation

# Electrical and Electronic Engineering Course

Electrical and electronic engineering has greatly contributed to the realization of a convenient and rich modern society. Electrical and electronic engineering has become important in realizing technologically advanced and sustainable society. The electrical and electronic engineering course covers a wide range of disciplines such as electrical energy, electrical equipment, advanced electronic devices, measurement and signal analysis. The course will cultivate human resources who have acquired creative thinking and flexible application abilities, by having them actively engage in research of a special field or technologically integrated fields.



[https://www.riko.akita-u.ac.jp/en/intro/courses/electronic\\_engineering.html](https://www.riko.akita-u.ac.jp/en/intro/courses/electronic_engineering.html)

## Electric Energy and Electrification Engineering

Education and researches on generation, conversion and storage of electric energy, and engineering design oriented to human and environment, contributing a sustainable society

Name	Title	Research Theme
Kumagai Seiji	Prof.	Study on energy devices such as batteries and the related materials, and their introduction to power systems and society
Kabir Mahmudul	Associate Prof.	Study on non-linear electric materials and their application to environmental purification

## Electronic Device and Measurement Engineering

Education and researches on developments of electronic devices including magnetic, optical, photoelectric conversion and high-frequency electromagnetic devices, and advancements of sensing, signal processing, information analysis and diagnosis technologies, intended for high speed and large capacity telecommunication and aging society

Name	Title	Research Theme
Yamaguchi Rumiko <small>*This Professor is going to be retired in March 2027.</small>	Prof.	Study on measurement of liquid crystal physical property, liquid crystal molecular alignment technique, and electro-optical characteristic of liquid crystal devices
Kawamura Marenori	Prof.	Study on fabrication of novel liquid crystal devices and their applications
Kikuchi Nobuaki	Prof.	Study on Analysis and Development of Magnetic Functionalities
Tanaka Motoshi	Prof.	Study on analysis of acoustic signals and biological information related to human activity and its application
Sato Yuichi <small>*This Associate Professor is going to be retired in March 2028.</small>	Associate Prof.	Study on semiconductor thin film and photoelectric conversion devices
Fukuda Makoto	Associate Prof.	Study on measurement techniques of non-linear ultrasonic wave and their applications
Yodokawa Shin-ichi	Lecturer	Study on electromagnetic wave propagation in millimeter and submillimeter
Hosoki Ai	Lecturer	Study on chemical sensors using fiber optics and their applications

# Human-Centered Computing Course

Human-Centered Computing Course offers education and research to solve regional community issues and create new value, through the development of human-centered information processing systems. Students learn advanced and state-of-the-art applied technologies based on computer science.

The main fields and targets of the curriculum are as follows.

1. Computer science (CS) and information technology (IT)
2. Modeling and analysis methods for human, society, culture, and nature
3. Exploring a good design for IT environment, with a focus on humans
4. Ability to conduct research and development having high creativity



[https://www.riko.akita-u.ac.jp/en/intro/courses/human\\_information.html](https://www.riko.akita-u.ac.jp/en/intro/courses/human_information.html)

## Sensing and Image Processing Technologies for Building Human-Centered Information Systems

Aiming to realize a human-centered information society, education and research is conducted in the field of human sensing focusing on analysis of lip movement and facial expression, remote sensing (Satellites and UAV), image processing, image information applications, visual recognition, affective engineering, behavior analysis, and computer security.

Name	Title	Research Theme
Kageyama Yoichi	Prof.	Remote sensing, human sensing, image processing and image information applications
Ishizawa Chikako	Prof.	Human error prevention technologies and utilization of color information
Yokoyama Hiroshi	Associate Prof. (Center for Information Technology and Management)	High-reliable design method of computer systems and application of network systems
Shirai Hikaru	Lecturer	Analysis algorithms for remote sensing and their applications

## Human Support Technologies to Maintain Health and Transfer Skills

Education and research is conducted in the field of medical and welfare engineering, such as frailty prevention and hyperthermia for the elderly to maintain health and QOL, skill learning support technology using xR (VR, AR, MR, etc.) and MoCap (Motion Capture), welfare information engineering to compensate for disability.

Name	Title	Research Theme
Mitobe Kazutaka	Prof.	Magnetic hyperthermia, human computer interaction, VR/MR training and testing.
Fujiwara Katsuya	Prof.	VR simulators for medical training, assessment systems for cognitive function, and remote collaboration systems.
Nakajima Sawako	Associate Prof.	Accessible technology and sensory substitution system.

## Spatial Informatics for Human-Centered Real-World Information Services

Research in this laboratory focuses on design, modelling, software development and evaluation of innovative human-centered real-world information services based on spatial data fusion and analysis using GPS, camera, motion and compass sensors on smartphones. Examples of the services are human-centered mobile mapping for supporting tourists, real world e-learning, and indoor AR (augmented reality) navigations for Mineral Industry Museum of Akita University.

Name	Title	Research Theme
Arikawa Masatoshi	Prof.	Design and analysis on real world information environments for supporting human activity
Lu Min	Lecturer	Ubiquitous mapping technology integrating analog and digital information, and its application in education and tourism.

# Mechanical Engineering Course

Mechanical engineering is based on disciplines including mechanics of materials, thermodynamics, fluid mechanics, mechanics and control engineering. The Mechanical Engineering course provides education and research to deepen the specialist knowledge acquired at undergraduate level and to acquire the ability to apply it. The course aims to nurture human resources with problem-solving and communication skills who can contribute to the formation of a sustainable society in which humans, the environment and machines are in harmony with each other from a global perspective.



[https://www.riko.akita-u.ac.jp/en/intro/courses/mechanical\\_engineering.html](https://www.riko.akita-u.ac.jp/en/intro/courses/mechanical_engineering.html)

## Aerospace System

Next-Generation Efficient Transportation / Mobility System

Name	Title	Research Theme
Yamaguchi Makoto	Prof.	Raman spectroscopic characterization of subsurface structure
Zhao Xu	Associate Prof.	Morphology control of nanostructures and creation / reliability evaluation of functional materials

## Medical System Engineering

Development of advanced medical and healthcare devices for supporting all generation's peoples living an aging society

Name	Title	Research Theme
Naganawa Akihiro	Prof.	Development of medical devices and new actuators, Study on control method of mechanical systems
Iwami Takehiro	Prof.	Reconstruction of motor function and medical engineering
Sasaki Yoshihiro	Associate Prof.	Development of fluid control technology making full use of the advantages of hydraulic systems and pneumatic systems
Yamamoto Yoshiyuki	Associate Prof.	Study on dynamics and medical applications of functional magnetic nanomaterials
Takahashi Mamoru	Associate Prof.	Study on evaluation of synthesized films and synthesis of films for surface modification of mechanical materials and biomaterials
Seki Takeshi	Lecturer	Development of medical/ industrial devices using optical systems and machine parts.

## Environmentally Friendly System

Renewable energy and the system construction

Name	Title	Research Theme
Miyano Yasuyuki	Prof.	Reliability assessment of structural materials, Research on applications of advanced joining and processing technologies
Komatsu Yoshimi	Associate Prof.	Heat and mass transfer with phase change
Sugiyama Wataru	Lecturer	Small wind turbine, rarefied gas flow

# Civil and Environmental Engineering Course

Civil and Environmental Engineering Course carries out education and research to provide professional knowledge on structural mechanics, construction materials, soil mechanics, hydraulics and transport system planning, to improve problem solving ability and applicability of skills based on the knowledge, and to cultivate communication ability for co-operative problem solving, as a goal to contribute to development of social infrastructure which is resilient in natural disasters, comfortable, and sustainable.



[https://www.riko.akita-u.ac.jp/en/intro/courses/civil\\_and\\_environmental.html](https://www.riko.akita-u.ac.jp/en/intro/courses/civil_and_environmental.html)

## Structural Engineering

Study on new type structures such as easily assembled timber bridges utilizing characteristics of timber materials, Origami structures utilizing those folding and development characteristics, and so on

Name	Title	Research Theme
Gotou Humihiko	Prof.	Study on performance evaluation of structures using 3D structural analysis simulation

## Hydraulics and Hydraulic Engineering

Education and research are as follows. Study on disaster prevention system for a tsunami and floods using observation and numerical calculation. Study on water environment system for estuary using the topographical survey and numerical simulation.

Name	Title	Research Theme
Watanabe Kazuya	Associate Prof.	Study on disaster prevention system for tsunami and floods

## Geotechnical Engineering

Study about methods for evaluating soil properties and estimating status of grounds

Name	Title	Research Theme
Ogino Toshihiro	Associate Prof.	Research in strength and deformation characteristics of unusual soils

## Urban and Traffic Planning

We are conducting education and research on cities, roads, and public transportation to ensure that all people, including the elderly and disabled, can live comfortably and safely. We also aim to develop and operate comprehensive urban and transportation systems that are in harmony with the natural environment.

Name	Title	Research Theme
Hamaoka Hidekatsu	Prof.	Creation of a road environment that can be used safely and securely

## Concrete Engineering

Study on properties of concrete and other construction materials, development of environmental conscious concrete and durability of concrete structures

Name	Title	Research Theme
Tokushige Hidenobu	Prof.	Deterioration mechanism such as frost damage of concrete and performance of environmental conscious concrete

# Cooperative Major in Sustainable Engineering

<https://www.sustainable.riko.akita-u.ac.jp/sustainable/en>



Electromobility Course



Social environment system Course

The Cooperative Major in Sustainable Engineering is a joint graduate school of Akita University and Akita Prefectural University which is started from April 2022. The course focuses on education and research in the field of sustainable engineering to contribute to the sustainable development of the region and to contribute to reduction of environmental load and the promotion of industry in Japan and the region by acquiring advanced expertise in sustainable engineer.

## Electromobility Course

The electrification of power systems utilizing internal-combustion engine for aircrafts, automobiles, railways and ships reduces CO<sub>2</sub> emissions of transportation. In the course, the education and research on motorization of mobility are given in cooperation with the 'Electrification System Joint Research Center', and overseas universities and research institutes.

Name	Title	Research Theme
Tajima Katsumi	Prof.	Coupled analysis of circuit - magnetic - motion - heat in electrical machinery and apparatus
Adachi Takahiro	Prof.	Thermal management for Environmental Control System of Aircraft Electrification
Akinaga Takeshi	Associate Prof.	Conceptual aerofoil design based on hybrid laminar flow control / A restorative approach to agriculture
Miura Takeshi	Associate Prof.	Study on automatic control and system optimization
Takamure Kotaro	Associate Prof.	Analysis of Heat Exhausting Characteristics of High Performance Motor used in Aircraft Electrification
Kinoshita Yukinori	Lecturer	Nano-level characterization of ultra low-power electronic/magnetic devices
Hirayama Hiroshi	Lecturer	System design of spacecraft and electric aircraft

## Social Environment System Course

The education and research in this course focus on the following,

- technologies of efficient utilization of renewable energy
- environmental-friendly designs through life cycle of product including resource exploitation, production, transportation, use, disposal and recycling.

Name	Title	Research Theme
Mishima Nozomu <small>*This Professor is going to be retired in March 2028.</small>	Prof.	Study on evaluation methods of product eco-efficiencies/resource efficiencies
Fukuyama Mayuko	Prof.	Environmental studies on chemistry and Earth system
Takahashi Hiroshi <small>*This Associate Professor is going to be retired in March 2028.</small>	Associate Prof.	Development of new chemical processes, and its visualization of operating data via IoT techniques
Sato Yoshiyuki	Associate Prof.	Research on materials design by computer
Sugawara Toru	Associate Prof.	Studies on high-temperature properties of molten oxides and their application
Furubayashi Takaaki	Associate Prof.	Design and analysis of sustainable energy systems

# Graduate School of Advanced Healthcare Engineering

[https://www.akita-u.ac.jp/honbu/healthcare/heal\\_en.html](https://www.akita-u.ac.jp/honbu/healthcare/heal_en.html)

'Graduate School of Advanced Healthcare Engineering' is a new graduate school established cooperatively with Graduate School of Medicine and Graduate School of Engineering Science of Akita University to integrate each field.

We will develop human resources who will support an aging society by conducting education and research that take advantages of the strength of both parties.

## Inspection and Diagnostic Field

### Division of Engineering

Name	Title	Research Theme
Mitobe Kazutaka	Prof.	Education and research on examination / diagnosis technology based on behavior in xR environment and examination / treatment technology applying electromagnetism.
Kageyama Yoichi	Prof.	Examinations and diagnostic support, and estimation of emotional / physical condition change using various sensing, image processing, and machine learning.
Fujiwara Katsuya	Prof.	Mild cognitive impairment test by finger dexterity assessment, and VR simulator for training surgery.
Tanaka Motoshi	Prof.	Study on analysis of biological information, such as EEG and ECG, and acoustic signals related to human activity, and its application for examination and diagnosis.
Nakajima Sawako	Associate Prof.	Welfare technologies for elderly and sensory impaired people to enjoy media content using speech synthesis and natural language processing.



### Division of Medicine

Name	Title	Affiliation
Bando Yoshio	Prof.	Graduate School of Medicine Doctoral Course in Medicine Bioregulatory Medicine Department of Anatomy
Hozumi Yasukazu	Prof.	Graduate School of Medicine Doctoral Course in Medicine Bioregulatory Medicine Department of Cell Biology and Morphology
Miki Takafumi	Prof.	Graduate School of Medicine Doctoral Course in Medicine Bioregulatory Medicine Department of Cell Physiology
Ishii Satoshi	Prof.	Graduate School of Medicine Doctoral Course in Medicine Bioregulatory Medicine Department of Immunology
Kono Michihiro	Prof.	Graduate School of Medicine Doctoral Course in Medicine Organ Function-Oriented Medicine Department of Dermatology and Plastic Surgery
Mori Naoko	Prof.	Graduate School of Medicine Doctoral Course in Medicine Bioregulatory Medicine Department of Radiology
Nomura Kyoko	Prof.	Graduate School of Medicine Doctoral Course in Medicine Public Health and Environmental Medicine Department of Environmental health science and Public Health
Hasegawa Hitoshi	Prof.	Graduate School of Medicine Doctoral Course in Medicine Public Health and Environmental Medicine Department of Medical Education
Ueki Shigeharu	Prof.	Graduate School of Medicine Doctoral Course in Medicine Bioregulatory Medicine Department of General Medical Practice and Laboratory Diagnostic Medicine
Otsubo Tetsuya	Prof.	Graduate School of Medicine Doctoral Course in Medicine Public Health and Environmental Medicine Department of Medical Informatics

## Exercise and Treatment Field

### Division of Engineering

Name	Title	Research Theme
Naganawa Akihiro	Prof.	Education and research on new healthcare devices and treatment support devices using mechatronics technology.
Iwami Takehiro	Prof.	Research and Education on medical engineering and robotics for the reconstruction of motor function
Sasaki Yoshihiro	Associate Prof.	Development of functional devices using fluid actuators and research on power assist systems.
Yamamoto Yoshiyuki	Associate Prof.	Study on dynamic properties of magnetic fluids under an alternating magnetic field and its application for non-invasive treatment
Takahashi Mamoru	Associate Prof.	Study on evaluation of synthesized films and synthesis of films for surface modification of biomaterials
Seki Takeshi	Lecturer	Research of the temperature estimation method of laser irradiated area and the laser power control method for Photothermal Therapy.



### Division of Medicine

Name	Title	Affiliation
Shibata Hiroyuki	Prof.	Graduate School of Medicine Doctoral Course in Medicine Oncoregulatory Medicine Department of Clinical Oncology
Nakayama Katsutoshi	Prof.	Graduate School of Medicine Doctoral Course in Medicine Organ Function-Oriented Medicine Department of Respiratory Medicine
Imai Kazuhiro	Prof.	Graduate School of Medicine Doctoral Course in Medicine Oncoregulatory Medicine Department of Thoracic Surgery
Watanabe Hiroyuki	Prof.	Graduate School of Medicine Doctoral Course in Medicine Organ Function-Oriented Medicine Department of Cardiovascular Medicine
Miyakoshi Naohisa	Prof.	Graduate School of Medicine Doctoral Course in Medicine Organ Function-Oriented Medicine Department of Orthopedic Surgery
Waki Hironori	Prof.	Graduate School of Medicine Doctoral Course in Medicine Bioregulatory Medicine Department of Metabolism and Endocrinology
Wakasa Masahiko	Prof.	Graduate School of Medicine Doctoral Course in Health Sciences Department of Physical Therapy
Kume Yu	Prof.	Graduate School of Medicine Doctoral Course in Health Sciences Department of Occupational Therapy
Ota Hidetaka	Prof.	Advanced Research Center for Geriatric and Gerontology
Takano Hiroshi	Associate Prof.	Graduate School of Medicine Doctoral Course in Medicine Organ Function-Oriented Medicine Department of Oral and Maxillo-Facial Surgery
Nanjo Hiroshi	Associate Prof.	Hospital Division of Clinical Pathology
Takahashi Yusuke	Lecturer	Graduate School of Medicine Doctoral Course in Medicine Organ Function-Oriented Medicine Department of Neurosurgery
Kikuchi Yukiko	Lecturer	Graduate School of Medicine Doctoral Course in Health Sciences Department of Basic Nursing
Takagai Junko	Assistant Prof.	Graduate School of Medicine Doctoral Course in Health Sciences Department of Clinical Nursing

# Graduate Student Support

## Admission Fee & Tuition (estimate)

### ● Graduate Student

Admission Fee: ¥282,000 / Annual Tuition: ¥535,800

\*Note that these fees are the same for enrollment in both the master's and the doctoral degree programs. Enrollees who join the doctoral course immediately after completing a master's degree program at Akita University do not have to pay the doctoral course admission fee.

## Graduate Student Support

### ● Admission fee exemption and deferment

Graduate students who have excellent academic records and are facing financial difficulties, as well as those whose guarantors have died, and also graduate students and/or their guarantors who have been affected by a natural disaster within 1 year before admission, are eligible to apply for exemption and/or deferment of the admission fee. Deferment or exemption (either full or half the admission fee) is decided after a review process. Applications are required to be made by students themselves prior to entering the university.

### ● Tuition fee exemption and deferment

Graduate students who have excellent academic records and are facing financial difficulties, as well as those whose guarantors have died, and also graduate students and/or their guarantors who have been affected by a natural disaster, are eligible to apply for exemption and/or deferment of the tuition fee. Deferment or exemption (either full or part) is decided after a review process. Applications are required to be made by students themselves prior to university entry.

## Scholarship \* Scholarships are awarded competitively to students after a review process

### a) International Student Scholarship Program

Program for self-funded international students (excluding exchange students) provided through Japan Student Services Organization (JASSO)

### b) Privately Financed Scholarships

Various scholarship programs for self-funded international students (excluding exchange students)

### c) Graduate School of Engineering Science (Scholarship for international students)

The Graduate School of Engineering Science in Akita University provides return-free scholarships for self-funded international graduate students who need financial support. This scholarship is funded by the Hokko-kai.

◎Number of scholarships : about 5

◎Scholarship amount : ¥20,000/month (planned)

Note that scholarship payments may be suspended immediately if it is found that the recipients have quit or have been dismissed from the school, or have been awarded a return-free scholarship of ¥48,000 or more per month from other bodies.

For details, see "Scholarship Information" (<https://www.akita-u.ac.jp/honbu/global/en/abroad/inbound/scholarship.html>) on the Akita University website.

## Accommodation

### 1. Dormitory House for International Students

## 1

### International House "A" and "B"

5-minute walk to the University

Boarding fee	(House A) Single occupancy rooms: ¥5,900/month (House B) Single occupancy rooms: ¥15,000/month <small>*water, electricity and other living expenses not included</small>
Maximum period of residence	1 year

## 2

### International Student House

15-minute walk to the University

Boarding fee	Single occupancy rooms: ¥5,900/month <small>*water, electricity and other living expenses not included</small>
Maximum period of residence	1 year

## 3

### Nishiyachi Men's Dormitory

15-minute walk to the University

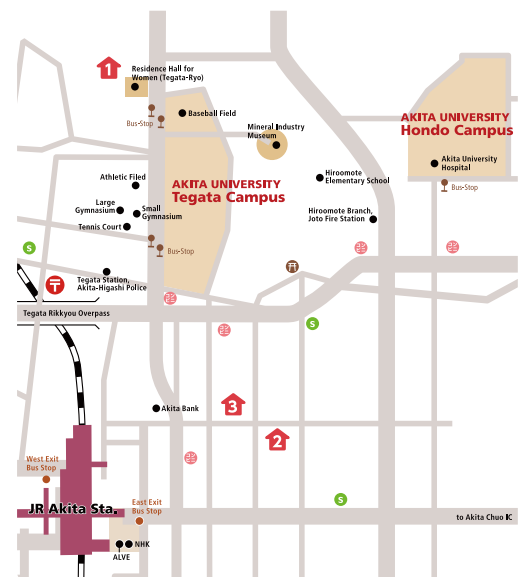
Dormitory house for both Japanese and international students. It is available until graduation. Boarding fee is ¥20,000/month.

### 2. Private Apartments

Apartments are usually found through Akita University Co-op or local real estate agents. Rent varies depending on the area or age of the apartment but is generally approximately ¥30,000/month for a 6-jo studio apartment with a kitchen and bathroom. ( 1-jo= 180cmx90cm)

\*2 or 3 months' rent as a deposit and / or "key money" may be required up front for signing a rental contract.

For details, see "Apartment Information" (<https://www.akita-u.ac.jp/honbu/global/en/abroad/inbound/apartment.html>) on the Akita University website.



# Japanese Government (MEXT) Scholarship Program

Special programs conducted by Graduate School of Engineering Science/Faculty of Integrated Science and Engineering for Environments, Akita University have been assigned from 2025 by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) to preferentially accept the recipients who have been awarded "MONBUKAGAKUSHO Scholarship".

## International Program for Green Science and Technology

This program will develop an existing program and launch the "International Program for Green Science Technology" in October 2025, a cross-disciplinary educational program that teaches environmentally conscious design with a focus on decarbonization and green energy. The program is aimed at international students, mainly from Southeast Asia, and aims to nurture future leaders with environmental science knowledge and advanced expertise who will play leading roles in their countries and industries.

For details, see "Japanese Government (MEXT) Scholarship Program"

([https://www.riko.akita-u.ac.jp/en/examination/mext\\_scholarship.html](https://www.riko.akita-u.ac.jp/en/examination/mext_scholarship.html)) on the Akita University website.

## Support for Pioneering Research Initiated by the Next Generation (SPRING)

The Graduate School of International Resource Sciences and the Graduate School of Engineering Science at Akita University will conduct a challenging research program for the next generation of researchers called the "Co-creative Doctoral Human Resource Development Program in Resource Science and Engineering Science for the Realization of Green Society". We will support doctoral students who are motivated to work toward the realization of a green society.

For details, see "Support for Pioneering Research Initiated by the Next Generation (SPRING)"

(<https://spring.riko.akita-u.ac.jp/>) on the Akita University website.

## Message from Senior

### Chng Cheng Jie

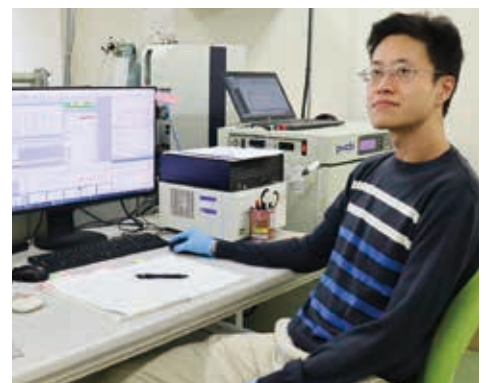
Graduated from the Department of Mathematical Science and Electrical-Electronic-Computer Engineering, Graduate School of Engineering Science, and is now working as a Postdoctoral Fellow in the same department.



### What is life without challenges

After receiving my Master's degree in November 2019, I decided to pursue a PhD, after discovering my passions for research on lithium-ion capacitors, a field I had explored during my undergraduate and Master's studies. I realised that I wanted to be a part of the research community in developing a high-performance energy storage for the benefit of our society. However, life is never meant to be easy. Covid-19 pandemic happened and disrupted my plans entirely. Two years of lockdown, I was confined to my home, jobless and idle. Despite that, I refused to give up and continuously expanding my knowledge in the field, until my arrival in Akita. I began my doctoral study under the guidance of Prof. Kumagai and encountered a lot of challenges. But I always thought that life is just like a video game, you are not on the right path if you do not face any difficulties or setbacks. Studying in Akita has been an amazing experience. The people, culture, and breathtaking scenery make it a truly unique place in my heart. I never thought of staying in Japan after completing my PhD, but now I am eager to work as a researcher here. Despite the language barrier, I have made a lot of friends through badminton club and circle. Thanks to them, my life outside of my study has become very interesting. Even though I am older than them, their determination and passion to become better players, both physically and mentally are really inspiring to me. Seeing them work so hard really motivates me, and it is my honour to be friends with them.

I would like to express my heartfelt gratitude to Prof. Kumagai and Dr. Abe for their guidance and assistance in my research. Despite my mistakes and failures, their unwavering and unconditional support has helped me grow a lot as both a person and a researcher. I truly cannot thank them enough for their role in my research journey in Akita. Without them, I would not have achieved the success I have today or become the researcher I aspire to be. For the future students: do not fear failures. Sometimes, things simply do not work out as planned no matter how prepared you are. You will face many difficult decisions and make mistakes along the way. But that is perfectly fine, as these experiences will make you grow into a better person. Challenges are what push us to learn, grow and achieve extraordinary things, even as an ordinary person.



Above) A photo of me when I travelled to Fukushima.  
Below) Monitoring the battery performances in the lab.

# Admission Information for International Students

## Master's Courses \*Based on 2026 application schedule

### Special Entrance Examination for International Students

The admission screening process shall comprise an academic ability test and a thorough document review. The results of both evaluations shall be considered in determining eligibility for admission.

#### Admission Schedule

Prior Screening of Applicants' Qualifications (certain applicants only)	Application Period	Examination Date	Announcement of Results
May	June	July	July

#### Affiliated School Recommendation

The selection is based on a thorough analysis of all the documents that have been submitted by the applicant.

#### Application Period

October (Fall) Admission	June
April (Spring) Admission	October

## Doctoral Courses \*Based on 2026 application schedule

### Special Entrance Examination for International Students

The admission screening process shall comprise an academic ability test and a thorough document review. The results of both evaluations shall be considered in determining eligibility for admission.

#### Admission Schedule

Prior Screening of Applicants' Qualifications (certain applicants only)	Application Period	Examination Date	Announcement of Results
May	June	July	July

#### Affiliated School Recommendation

The selection is based on a thorough analysis of all the documents that have been submitted by the applicant.

#### Application Period

October (Fall) Admission	June
April (Spring) Admission	October

### International Doctoral Courses in English

The selection is based on a thorough analysis of all the documents that have been submitted by the applicant.

#### Application Period

October (Fall) Admission	June
April (Spring) Admission	October

## Access

### From Tokyo

- Haneda Airport - Akita Airport (approx. 1hr)
- JR Tokyo Station - Akita Station (approx. 4hrs by Komachi, Akita Shinkansen)

### From Nagoya

- Chubu Int'l Airport - Akita Airport (approx. 1hr 30mins)

### From Osaka

- Osaka Int'l Airport (Itami) - Akita Airport (approx. 1hr 30mins)

### From Sapporo

- New Chitose Airport - Akita Airport (approx. 1hr)



## Akita University Graduate School of Engineering Science

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