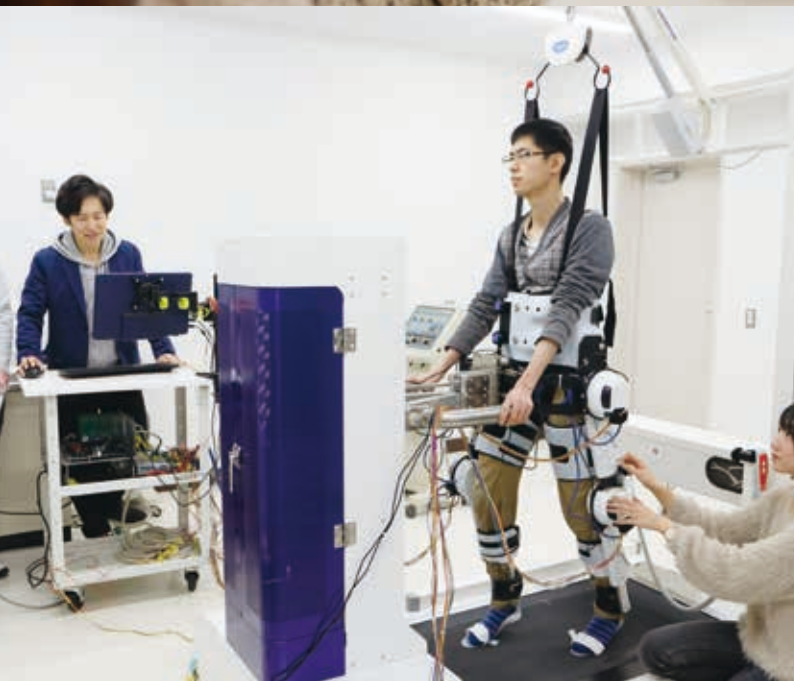


GRADUATE SCHOOL OF ENGINEERING SCIENCE AKITA UNIVERSITY 2022



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Greeting

Regional revitalization through strengthening scientific education.

Educating and preparing students to deliver technological innovation in the global community.

The world is said to be at the start of a new era of technological innovation: The Fourth Industrial Revolution. Coming out of the Third Industrial Revolution, where electronics and computers made work more efficient and our lives easier, the Fourth Industrial Revolution brings the real world and cyberspace much closer together - making big changes in society. The Japanese Government has recognized the huge implications of this revolution, and is implementing "Society 5.0" to guide Japan in this new era. The main driving forces of this era involve The Internet of Things (devices communicating independently) providing enormous amounts of information (Big Data), which can be analyzed by AI to give us useful information about the world and society that can be used to improve the lives of countless people. Society 5.0 seeks to balance the power inherent in the Fourth Industrial Revolution by making "a human-centred society that balances economic advancement with the resolution of social challenges by a system that highly integrates cyberspace and physical space." The focus of resolving social issues will help revitalize the regions, as these areas of Japan face the greatest social challenges. By default, Society 5.0 needs talented young people with deep expertise and broad viewpoints, who are capable of understanding and integrating new concepts and techniques. The academic staff of the School of Engineering Science, while having a major focus on their own specialized fields, cooperate to help students develop engineering design abilities across a number of fields, so that they will be able to support Society 5.0 in the future.

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 life-cycle design engineering, which is jointly managed with Akita Prefectural University. Additionally, our Research Center for Advanced Materials for Breakthrough Technology helps students conduct research to develop the new materials needed to drive technological innovation. 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 in Society 5.0.



YAMAMURA Akihiro
Dean of Graduate of Engineering
Science

Graduate School of Engineering Science

The Graduate School of Engineering Science aims to produce top-level internationally-minded engineers and researchers who can contribute to regional industry development as well as the international community. Additionally, the school enhances cooperation with regional companies and local governments in order to promote regional revitalization which is becoming an urgent issue.

Master's Degree Program

- Life Science
- Materials Science
- Mathematical Science and Electrical-Electronic-Computer Engineering
- Systems Design Engineering
- Cooperative Major in Life Cycle design Engineering
- Graduate School of Advanced Healthcare Engineering

Doctoral Degree Program

- Integrated Engineering Science

The Doctoral Degree Program separately provides an English course in which the entire curriculum is conducted in English.

*Cooperative Major in Life Cycle Design Engineering is going to be newly reorganized into Cooperative Major in Sustainable Engineering in April, 2022.

Graduate School of Advanced Healthcare Engineering

'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

Graduate School of Engineering Science

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.
Tanaka Motoshi	Associate 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.
Fujiwara Katsuya	Associate Prof.	Mild cognitive impairment test by finger dexterity assessment, and VR simulator for training surgery.
Nakajima Sawako	Lecturer	Education and research on welfare technologies for elderly and visually impaired people to enjoy videos and movies using speech synthesis.



Graduate School of Medicine

Name	Title	Affiliation
Ono Kyoichi	Prof.	Graduate School of Medicine Doctorial Course in Medicine Bioregulatory Medicine Department of Cell Physiology
Bando Yoshio	Prof.	Graduate School of Medicine Doctorial Course in Medicine Bioregulatory Medicine Department of Anatomy
Hozumi Yasukazu	Prof.	Graduate School of Medicine Doctorial Course in Medicine Bioregulatory Medicine Department of Cell Biology and Morphology
Ishii Satoshi	Prof.	Graduate School of Medicine Doctorial Course in Medicine Bioregulatory Medicine Department of Immunology
Hashimoto Manabu	Prof.	Graduate School of Medicine Doctorial Course in Medicine Bioregulatory Medicine Department of Radiology
Kono Michihiro	Prof.	Graduate School of Medicine Doctorial Course in Medicine Organ Function-Oriented Medicine Department of Dermatology and Plastic Surgery
Nomura Kyoko	Prof.	Graduate School of Medicine Doctorial Course in Medicine Public Health and Environmental Medicine Department of Environmental health science and Public Health
Hasegawa Hitoshi	Prof.	Graduate School of Medicine Doctorial Course in Medicine Public Health and Environmental Medicine Department of Medical Education
Ueki Shigeharu	Associate Prof.	Graduate School of Medicine Doctorial Course in Medicine Bioregulatory Medicine Department of General Medical Practice and Laboratory Diagnostic Medicine

Exercise and Treatment Field

Graduate School of Engineering Science

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.



Graduate School of Medicine

Name	Title	Affiliation
Shibata Hiroyuki	Prof.	Graduate School of Medicine Doctorial Course in Medicine Oncoregulatory Medicine Department of Clinical Oncology
Nakayama Katutoshi	Prof.	Graduate School of Medicine Doctorial Course in Medicine Organ Function-Oriented Medicine Department of Respiratory Medicine
Minamiya Yoshihiro	Prof.	Graduate School of Medicine Doctorial Course in Medicine Oncoregulatory Medicine Department of Thoracic Surgery
Watanabe Hiroyuki	Prof.	Graduate School of Medicine Doctorial Course in Medicine Organ Function-Oriented Medicine Department of Cardiovascular Medicine
Miyakoshi Naohisa	Associate Prof.	Graduate School of Medicine Doctorial Course in Medicine Organ Function-Oriented Medicine Department of Orthopedic Surgery
Fukuda Masayuki	Associate Prof.	Hospital Dentistry and Oral Surgery
Nanjo Hiroshi	Associate Prof.	Hospital Division of Clinical Pathology
Imai Kazuhiro	Associate Prof.	Graduate School of Medicine Doctorial Course in Medicine Oncoregulatory Medicine Department of Thoracic Surgery
Fujita Hiroki	Associate Prof.	Graduate School of Medicine Doctorial Course in Medicine Bioregulatory Medicine Department of Medical Biology
Matsunaga Toshiki	Associate Prof.	Hospital Rehabilitation Medicine
Takahashi Masataka	Lecturer	Hospital Neurosurgery

Cooperative Major in Sustainable Engineering

'Cooperative Major in Life Cycle Design Engineering', the joint Master degree program between the Graduate School of Engineering Science, Akita University and the Graduate School of Systems Science and Technology, Akita Prefectural University, is going to be reorganized as 'Cooperative Major in Sustainable Engineering Science' which is started from April 2022.

* As of April 2021, Akita University has requested the official authorization from the Ministry of Education, Culture, Sports, Science and Technology (MEXT). There might be changes in these contents of courses.

Sustainable engineering is an engineering field seeking to simultaneously achieve environmental protection, improvement of quality of living and social environment, and economic development for the sustainable development of society. In this course, we conduct education and research on the electrification of power systems of transportation, environmentally friendly design, and utilization of renewable energy. Regarding the electrification of power systems, we organically cooperate with Akita Prefecture, Akita Prefectural University, leading heavy industrial companies, and local companies (e.g. Aster Co. Ltd.) under the Cabinet Office Project, 'Industrial Creation by Research and Development of Small and Lightweight Electrification System'. It aims to promote the local electrification industry through our education and research. In the project, we are making foremost research and testing facilities in Japan as a base for electrification research.



Electromobility Course



Social environment system Course

Electromobility Course

The electrification of power systems utilizing internal-combustion engine for aircrafts, automobiles, railways and ships reduces CO₂ 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 Katsubumi	Prof.	Coupled analysis of circuit - magnetic - motion - heat in electrical machinery and apparatus
Adachi Takahiro	Prof.	Thermal management for aircraft a rotating cone
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
Kinoshita Yukinori	Lecturer	Nano-level characterization of ultra low-power electronic/magnetic devices
Yoshida Yukihiro	Lecturer	Study on analysis and design of permanent magnet motors
Hirayama Hiroshi	Lecturer	System design of spacecraft and electric aircraft

Social environment system Course

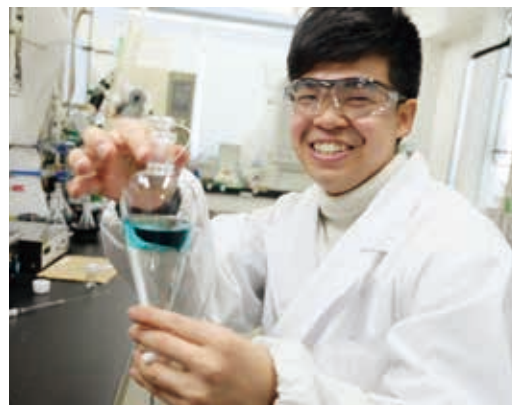
The education and research in this course focus on the following,

- 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	Prof.	Study on evaluation methods of product eco-efficiencies/resource efficiencies
Fukuyama Mayuko	Associate Prof.	Environmental studies on chemistry and Earth system
Takahashi Hiroshi	Associate Prof.	Development of new chemical processes, and its visualization of operating data via IoT techniques
Sato Toshiyuki	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

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.



Chemistry and Chemical Biology

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

Name	Title	Research Theme
Fujiwara Kenshu	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
Akiba Uichi	Associate Prof.	Studies on creation of bioelectrochemically functionalized interfaces
Amatatsu Yoshiaki	Associate Prof.	Computational design of photofunctional molecular devices
Kondo Yoshihiko	Associate Prof.	Supramolecular chemistry based on macrocyclic compounds
Matsumura Hirotochi	Associate Prof.	Studies on structure-function relationships within proteins for biomass applications

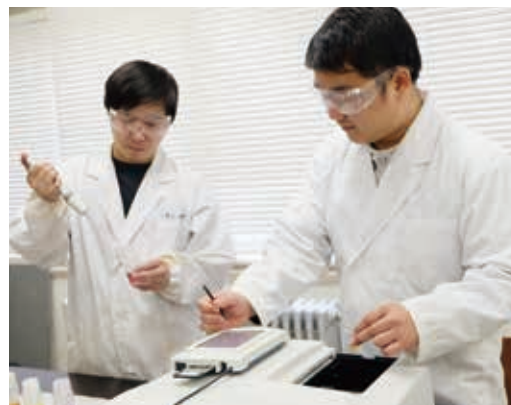
Molecular Cell Biology

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

Name	Title	Research Theme
Wakui Hideki *This professor will retire by the mandatory retirement regulation in March 2022.	Prof.	Basic and clinical studies of hematologic, renal, and rheumatic diseases
Hikida Masaki	Prof.	Study for regulatory mechanism of memory B cell activation
Kubota Hiroshi	Prof.	Study for neurodegenerative disease and protein aggregation (as an educational theme)
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.



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

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

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

Functional Surface Chemistry

Surface Processes for Environments and for a Production of Value-added Materials with Specific Functions

Name	Title	Research Theme
Shindo Takayoshi <small>*This professor will retire by the mandatory retirement regulation in March 2023.</small>	Prof.	Application of catalysis for energy conversion and environmental conservation
Inoue Yukihiko	Lecturer	Chemistry about organic reactions and functional polymers

Energy Chemical Engineering

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

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

Bioprocess Engineering

Bioprocess design and development by integrating biological and biochemical technologies, and creation and application of new functional biomaterials

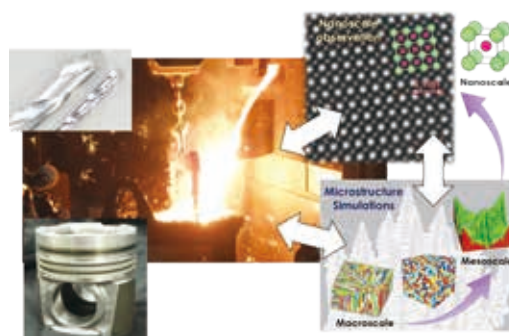
Supramolecular and Material Chemistry

Education and research for design of macrocyclic and acyclic compounds having molecular recognition capability and its functionality of molecular assembly

Name	Title	Research Theme
Yamada Manabu (Research Center of Advanced Materials for Breakthrough Technology)	Lecturer	Development of new molecules for separation of hard-to-separate organic compounds and precious metals

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 focusses 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.



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	Prof.	Study on the structural and functional control of environmental ceramic materials
Lu Xiaoye *This professor will retire by the mandatory retirement regulation in March 2022.	Associate Prof.	Development of Bi based high Tc oxide superconductors.
Natsume Yukinobu	Associate Prof.	Development of numerical simulation model to predict the solidification structures for alloys
So Yeong-Gi	Lecturer	The atomic structure and physical properties of metals and alloys
Hasegawa Takashi	Lecturer	Development of advanced magnetic materials by sputtering method and nanotechnology
Tsujiuchi Yutaka	Lecturer	Development of molecular electronics device using organic molecules and semiconductor
Kawano Naoki	Lecturer	Development of phosphor materials for radiation detection

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 (Research Center of Advance Materials for Breakthrough Technology)	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
Takahashi Hiroki	Lecturer	Development of electrode materials for fuel cells and electrolytic process such as CO ₂ reduction and oxygen evolution reaction
Goto Ikuzo	Lecturer	Research on higher-performance castings

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.



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	Prof.	Combinatorial group and semigroup theory, combinatorial designs, cryptology and information security
Fazekas Szilard Szolt	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 phenomena created by points that move in various patterns starting from various places (analytical field).

Name	Title	Research Theme
Kawakami Hajime	Prof.	Mathematical study of inverse problems
Kobayashi Mahito	Associate Prof.	Theory and application of shape analysis by mappings.
Nakae Yasuharu	Lecturer	Low-dimensional topology, especially foliation theory in 3-dimensional manifolds

Theoretical Physics

Our subjects of research are quite diverse, covering topics from elementary particles and nuclei, various groups of materials consisting of atoms and molecules, to the universe. We mainly focus on theoretical physics.

You 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
Tanuma Yasunari	Associate Prof.	Theoretical study of unconventional superconductors in non-uniform systems

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.



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
Saito Hitoshi	Prof.	Study on magnetic measuring techniques on nano-meter scale and their application to advanced magnetic device assessment
Yamaguchi Rumiko	Prof.	Study on measurement of liquid crystal physical property, liquid crystal molecular alignment technique, and electro-optical characteristic of liquid crystal devices
Sato Yuichi	Associate Prof.	Study on semiconductor thin film and photoelectric conversion devices
Tanaka Motoshi	Associate Prof.	Study on analysis of acoustic signals and biological information related to human activity and its application
Kawamura Marenori	Associate Prof.	Study on fabrication of novel liquid crystal devices and their applications
Muroga Sho	Associate Prof.	Study on low-noise and highly-efficient electronic devices in ultra high frequency band
Fukuda Makoto	Lecturer	Study on measurement techniques of non-linear ultrasonic wave and their applications
Yodokawa Shinichi	Lecturer	Study on electromagnetic wave propagation in millimeter and submillimeter

Human-Centered Computing Course

In the Human-Centered Computing Course, we are conducting 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 up-to-date applied technologies based on computer science.

The main field and target of the curriculum are as follows.

1. Computer science 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



Human support technologies to maintain health and transfer skills

We are conducting education and research 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.	Bioengineering research on measurement and support technology for human utilizing information technology
Fujiwara Katsuya	Associate Prof.	Design of software systems for remote support and collaboration, and development of VR simulators and measuring systems for sensorimotor and cognitive tests
Nakajima Sawako	Lecturer	Study on sensory substitution and development of accessible media

Sensing and image processing technologies for building human-centered information systems

Through education and research 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, we aim to realize a human-centered information society.

Name	Title	Research Theme
Kageyama Yoichi	Prof.	Remote sensing, human sensing, image processing and image information applications
Ishizawa Chikako	Associate 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

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. Examples of the services are human-centered mobile mapping for supporting tourists and real-world e-learning, and public observation systems of extracting gazing regions of people in museums, exhibitions and stores.

Name	Title	Research Theme
Arikawa Masatoshi	Prof.	Design and analysis on real world information environments for supporting human activity

Network modeling and optimization

(1) Traffic engineering using linear and nonlinear metrics such as reliability, congestion rate, number of wavelengths, etc.

(2) New approach to route determination utilizing graph property, such as the number of reachable routes for robust network.

IoT network systems: Service proposals (such as watching system) having user programmability, its configuration and verification methods.

Name	Title	Research Theme
Hashimoto Masashi	Associate Prof.	Traffic engineering and network optimization, IoT network system and its design method

Mechanical Engineering Course

Our Mechanical Engineering Course provides education and research in the following areas: Aerospace System, Medical System Engineering, and Environmentally Friendly System that will be necessary in the future. Our goal is to foster R&D / Engineers who have both fundamental knowledge in each specialised field and skills to integrate cross-disciplinary ideas to contribute in solving local and international problems.



Aerospace System

Next-Generation Efficient Transportation / Mobility System

Name	Title	Research Theme
Muraoka Mikio	Prof.	Nanotechnology for structural and functional materials
Yamaguchi Makoto	Associate Prof.	Raman spectroscopic characterization of subsurface structure
Zhao Xu	Lecturer	Morphology control of nanostructures and fabrication / reliability evaluation of electro-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
Tago Makoto *This professor will retire by the mandatory retirement regulation in March 2023.	Prof.	Numerical simulation of a downhole heat exchanger, and melting behavior of ice in a aqueous binary solution
Okuyama Eiki	Prof.	Nano-metrology and ultra-precision mechanism design
Miyano Yasuyuki	Associate Prof.	Research on joining and welding processing for structural materials / Elucidation of the mechanism of bio-corrosion of metals
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.



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
Hino Satoru	Associate Prof.	Infrastructure planning for sustainable city and public transportation in local cities

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

Environmental Engineering and Science

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, half or one-third) is decided after a review process. Applications are required to be made by students themselves prior to university entry.

Scholarship and Loan Programs

<Japan Student Services Organization Loan> (*return required)

Graduate students who are diligent and have excellent academic records and are facing financial difficulties can apply for a loan. These are awarded competitively to students after a review process. Loan applications are examined and recommended by Akita University with a final decision by the Japan Student Services Organization (JASSO).

●Category 1 Loans (interest-free, monthly)

- Master's degree program ¥50,000 / ¥88,000
- Doctoral degree program ¥80,000 / ¥122,000

●Category 2 Loans (interest-bearing, monthly)

¥50,000 / ¥80,000 / ¥100,000 / ¥130,000 / ¥150,000

(Selected from one of the five monthly loan amounts above)

●Special loan supplement for university entrance expenses (interest-free)

¥100,000 / ¥200,000 / ¥300,000 / ¥400,000 / ¥500,000 (Selected from one of the five amounts above)

<Akita University Scholarships>

●Scholarship for graduate students in the master's degree program(return-free)

The Graduate School of Engineering Science in Akita University provides a scholarship for graduate students in the Master's degree program who are facing financial difficulties in pursuing their studies, as well as diligent students who have excellent academic records. This scholarship is funded from donations through the Hokko-kai, the Faculty-supporters' association, and from the family of the late Mr. Tetsuya Mitsuno, a graduate of the Master's degree program.

- Number of scholarships: 13 per year
- Application period: July of the previous academic year for a 1st year master's degree student (i.e. prior to program entry); December of the previous academic year for a 2nd year student.
- Scholarship amount: ¥30,000/month or ¥100,000/year(planned)

Note that the scholarship payment may be suspended immediately if recipients have quit or have been dismissed from the university, or if they are awarded a return-free scholarship of ¥48,000 or more per month from other bodies.

●Scholarship for graduate students in the doctoral degree program(return-free)

The Graduate School of Engineering Science in Akita University provides some scholarships for the graduate students in the doctoral degree program who are both diligent and have excellent academic records. This scholarship is funded by donations through the Hokko-kai.

- Number of scholarships: a few (applications are made by student supervisors)
- Recruitment period : February of the academic year prior to program entry.
- Scholarship amount : ¥50,000/month (planned)

●Scholarship for self-funded international graduate students (return-free)

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
- Recruitment period : April of the current academic year
- 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.

<Other types of scholarship programs>

There are also many other scholarship programs provided by local governments and private organizations. The recruitment periods of these programs are concentrated between April and May each year. Recruitment information for some of these programs may be posted on university notice boards, but for many other programs information must be gathered by students themselves.

Student Figures *as May 1st,2020

	Total number admitted	International students
Graduate School of Engineering Sciences	374	35



China
24



Malaysia
2



Vietnam
3



Thailand
1



Taiwan
2



Zambia
1



Mozambique
2

Message from Senior

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- Faculty of Engineering and Resource Science, Akita University
- Graduate School of Engineering and Resource Science, Akita University
- Graduate School of Engineering Science, Akita University
- Department of Electrical Engineering, Graduate School of Engineering, Tohoku University



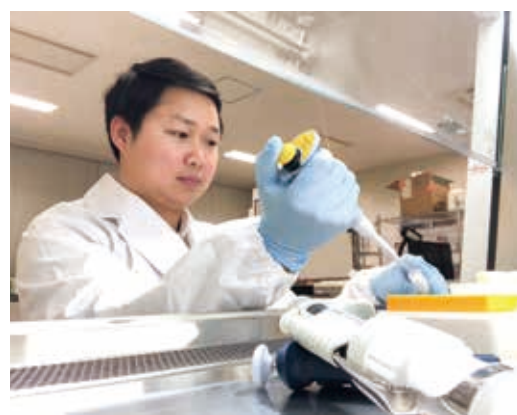
Vietnam

Face what you should aim for and do your best.

When I was a freshman at university in my home country, I wanted to acquire advanced technology and broaden my global perspective, so I chose Japan as a destination for studying abroad, not only in science and technology but also in culture. After coming to Japan as a government-sponsored international student and graduating from Wakayama National College of Technology, I deepened my acquired specialized knowledge and was keenly interested in research and development for medical applications that could make use of it. I went to Akita University, where I was focusing on research and development of cutting-edge cancer treatment devices (magnetic hyperthermia). I wanted to apply it to clinical practice as soon as possible and save people from cancer, so I went on to master and doctoral courses.

For 6 years from undergraduate to doctoral course, under the guidance of Professor Mitobe, I conducted joint research with the medical school and studied a minimally invasive thermal treatment system for hyperthermia chemotherapy to improve the quality of life (QOL) of inoperable advanced cancer patients. In particular, I developed a new high-performance magnetic material and established a technology to automatically localization for the position of the magnetic material embedded in the body. I also conducted R&D on technology to reduce body movement artifacts using a robot arm to improve the accuracy of the wireless temperature measurement method.

It is unclear what kind of career you will take in the future, and many students are worried about the future. First, draw your life goals and future plans. Then go to graduate school for self-investment (2 years master course, 3 years doctoral course) and steadily move towards your life goals.



Research and development bio experiment of bacteria sensor



Photo of Vietnam television station filming a program about Vietnamese students studying at AKITA University

Admission Information for international Students

Master's Courses *Based on 2020 application schedule

Special Entrance Examination for International Students

Screening for admission will be determined by the combined results of an academic ability test (interview) and a document review.

Admission Schedule

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

Affiliated School Recommendation

Admission is based on analysis of all documents submitted.

Application Period

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

Doctoral Courses *Based on 2020 application schedule

Special Entrance Examination for International Students

Screening for admission will be determined by the combined results of an academic ability test (interview) and a document review.

Admission Schedule

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

Affiliated School Recommendation

Admission is based on analysis of all documents submitted.

Application Period

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

International Doctoral Courses in English

Admission is based on analysis of all documents submitted.

Application Period

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

Access

From Tokyo

- Haneda Airport - Akita Airport (1hr 5mins)
- JR Tokyo Station - Akita Station
(approx. 4hrs by Komachi, Akita Shinkansen)

From Nagoya

- Chubu Int'l Airport - Akita Airport (approx. 1hr 25mins)

From Osaka

- Osaka Int'l Airport (Itami) - Akita Airport
(approx. 1hr 20mins)

From Sapporo

- New Chitose Airport - Akita Airport (55mins)



Akita University Graduate School of Engineering Science

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