

**Master's Courses
2022 April (Spring) Admission
Affiliated School Recommendation**

Application Guidelines

Application Period:

**2022 April (Spring) Admission
October 14, 2021 — October 20, 2021**

**Akita University
Graduate School of Engineering Science**

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

Master's Courses
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Affiliated School Recommendation
Graduate School of Engineering Science
Akita University

Application Guidelines

The Master's Courses are offered by Akita University Graduate School of Engineering Science to international students having a recommendation from one of Akita University's overseas affiliated schools. These courses provide the students with the opportunity to obtain a Master's Degree in either Science, Engineering Science or Engineering. **Japanese will be the main language used in the courses.**

The Akita University's overseas affiliated schools list is posted on our website.

1. Number to be Admitted

Department (Major)	Fall
Life Science	a few
Materials Science	a few
Mathematical Science and Electrical-Electronic-Computer Engineering	a few
Systems Design Engineering	a few
Cooperative Major in Sustainable Engineering	a few

2. Application Qualifications

- The status of residence of a incoming student must be "College Student."
- All of the qualifications below must be satisfied, and the enrollement at Akita University must be promised once the candidate is accepted.
 - (1) Applicants must have received higher education in the field of related their desired major.
 - (2) Applicants must have achieved the excellent academic performance.
 - (3) Applicants need to be people of integrity.
 - (4) Applicants must be recommended by either the president of their school or the dean of the faculty attended.
 - (5) Applicants must be able to graduate or have graduated from one of Akita University's overseas affiliated universities between April 1,2020 and March 31,2022

Note :

Applicants who are accepted based on the qualifications above, yet are later confirmed as not being able to complete the admission procedures by the deadline will not be admitted. Details on admission procedures will be sent to all accepted students along with a Letter of Acceptance.

3. Application Period and Mailing Address

(1) Application Period:

From October 14, 2021 to no later than October 20, 2021.

- 1) If brought in person or by proxy, application documents will be accepted at the Admissions Office between 9:00 a.m. and 4:00 p.m.
- 2) If mailed, application documents must be sent by registered mail and “Application to Master’s Course, Admission by Recommendation, Graduate School of Engineering Science” must appear in red on the front side of the envelope. The documents must reach the Admissions Office no later than 4:00 p.m. on October 20, 2021. Special attention should be paid in estimating the days needed for overseas delivery.

(2) Mailing address:

Admissions Office
Akita University
1-1, Tegata Gakuen-machi
Akita-shi 010-8502 Japan
Tel: +81-18-889-2313
E-mail: nyushi@jimu.akita-u.ac.jp

4. Application Procedures

(1) Documents to be submitted

① Letter of Recommendation

Recommendations must be written by the applicant’s supervising instructor and be issued by the president of the school or the dean of the faculty of the affiliated university.

② Application for Admission

Requested information must be entered on the designated form (attached herein).

③ ID Photo Card

A frontal-view photograph of the applicant’s face, without a hat, 4.5 cm x 3.5 cm in size and taken within three months prior to this application must be pasted in the designated area of the ID photo Card (attached herein).

④ Certificate of Completion or Prospective Completion or Certificate of Graduation

Must be prepared by the president or the dean of the school attended.

⑤ Academic Record Transcripts

Must be prepared by the president or the dean of the school attended and sealed in an envelope.

⑥ Proof of Evaluation Fee Payment

Evaluation Fee is 30,000 yen.

When depositing from an overseas bank, please make sure that the fee is sent by Telegraphic Transfer to the (below) bank account in yen. Payment made by other currency will not be accepted. Any cost for the transfer is to be paid by the applicant. Please enclose a copy of “Application for Remittance” when mailing the admission application documents.

1. Amount: 30,000 yen (The fee must be received in yen)

2. Remittance Method: Telegraphic Transfer

3. Remittance Fee: to be paid by the payer

4. Remittance Period: October 1, 2021 - October 20, 2021

Japan time must be observed.

5. Remittance Information:

Bank Name: Akita Bank, Ltd.

Branch: Tegata Branch

Address: 160-1, Aza-Yamazaki, Tegata, Akita-shi, Akita, 010-0851 Japan

Account Number: 688502

Recipient: Akita University

Bank Identifier Code(SWIFT): AKITJPJT

Note:

- a) When filling out the “Application for Remittance,” please enter “Evaluation fee” as “Purpose of Remittance,” and enter “applicant’s name” in the message box.
- b) After remitting the evaluation fee, Please send an e-mail to that effect to Admissions Office as soon as possible.
- c) In case of remitting the evaluation fee from the interior of Japan, Please send an e-mail to that effect to Admissions Office.
Admissions Office will give instructions to you.
Please don’t make a remittance before receiving instructions.
- d) If the Evaluation Fee received does not meet the required amount of 30,000 yen, the application procedure will be considered incomplete, and the application will not be accepted. The Evaluation Fee will be returned to the applicant, but the remittance fee will be withheld.

⑦ Other

- Applicants who live in Japan and do not have Japanese citizenship must submit a certified copy of Alien Registration issued by the municipality where they reside.
- Applicants residing overseas must submit an authorized certificate of his/her family register or proof of citizenship in home country.

Note: Important notices for submitting documents

- a) No application will be accepted unless all documents mentioned above are fully and accurately completed.
- b) Once submitted, documents will not be returned to applicants for any reason.
- c) Applicants are not allowed to change departments, major and courses after submission of application.
- d) If Contact Address entered in the application form changes after submission, the Admissions Office must be promptly notified of such change.
E-mail: nyushi@jimu.akita-u.ac.jp
- e) Attached forms may be either hand-written or typed.

5. Evaluation of Applicants

Screening for admission will be conducted based on analysis of all documents submitted.

6. Pre-consultation for Disabled Applicants

As a preliminary step in the application process, disabled applicants (refer to the chart below) who need special consideration during either the application process or the course itself must submit a document detailing the items listed below (form not designated) together with a medical certificate prepared by a doctor no later than September 24, 2021. Early consultation is recommended since advance preparation may be needed in cases of severe disability.

- ① Name, age, contact address, telephone number, and desired department(major) .
- ② Type and degree of disability.
- ③ Detailed explanation of care needed during application and course study.
- ④ Special preparation and care taken at the university last attended.
- ⑤ Description of everyday life.
- ⑥ Name, address, and telephone number of the university last attended.

If needs arise after the deadline of September 24, 2021 due to accident or other contingency, please contact the Admissions Office immediately.

Type of Disability	Extent of Disability
Visual	Those with eyesight of less than 0.3 with both eyes (Universal Eyesight Test Chart) or who have ophthalmologic functional disorders that do not allow easy recognition of normal size letters or diagrams, even with the use of a magnifying glass.
Hearing	Those with an auditory capacity of more than 60 decibels (Audiometer testing) who have difficulty listening to normal talking even with a hearing aid.
Physical	1. Those who are not capable of performing basic daily tasks such as walking or writing even with the use of orthopedic or prosthetic devices. 2. Those with physical disabilities not as severe as the above but who need constant medical assistance and/or observation.
Health	1. Those that are under constant medical restrictions due to prolonged chronic respiratory, kidney, nervous system illness, malignant growth, or other disorder. 2. Those placed under medical restrictions due to prolonged weak or feeble health.
Other	Those not specifically mentioned above, yet require special consideration when either applying for admission or attending classes during the course of study.

Translated from the original by the Graduate School of Akita University.

Note:

- a) The above are in conformity with Article 22-3 of the School Education Law Enforcement Regulations.
- b) Advance contact is also requested if the applicant uses a hearing aid, crutches, or a wheelchair on an everyday basis.

7. Acceptance Notification

Results are tentatively scheduled to be e-mailed to all applicants at 3:00 p.m on November 15, 2021.

Therefore telephone inquiries will not be honored. A letter of Acceptance will be sent to a successful applicant.

8. Promise of Enrollment

Accepted students must submit the Promise of Enrollment upon receipt of the Letter of Acceptance (a form enclosed with the Letter of Acceptance) to the Admissions Office no later than December 10, 2021. If this promise is not received by the deadline, it will be understood that enrollment will not take place.

9. Admissions Procedures

- (1) Details for Admission Procedures will be sent to all who are accepted along with the Letter of Acceptance. Accepted students are strongly advised to come to Japan in time to complete the Admission Procedures in person.

(2) School Fees (must be paid in Japanese currency)

- ① Admission fee: 282,000 yen (subject to change)
- ② Tuition: 267,900 yen for the first semester (535,800 yen for the first academic year) (subject to change)

Note :

- a) Admission fee paid will be not refunded for any reason.
 - b) The above school fees are projected amounts and are subject to change before or during the course. Revised admission fee will apply to all new students if the revision takes place before the end of the Admission Procedure Period. If the tuition is revised at the time of admission or during the course, the new tuition takes effect at the time of revision.
 - c) If a candidate cancels their admission before March 31, 2022 after completion of the Admission Procedures due to unavoidable circumstances, the tuition paid may be refunded upon the payer's request only after designated procedures are completed.
- (3) Other information
- 1) Those with an excellent academic standing yet who have difficulty paying the admission fee due to financial circumstances and those who demonstrate other financial needs may be eligible upon screening to apply for financial aid. Those accepted will be either exempt from paying all or half of the admission fee, or may be all owed to pay the fee at a later date.
 - 2) Those with an excellent academic standing yet who have difficulty paying the tuition due to financial circumstances and those who demonstrate other financial needs may be eligible upon screening to apply for financial aid. Those accepted will be either exempt from paying all, half or a third of the tuition, or may be allowed to pay the fee at a later date.

Admissions Office
Akita University
1-1, Tegata Gakuen-machi
Akita-shi 010-8502 Japan
Tel.: +81-18-889-2313
E-mail: nyushi@jimu.akita-u.ac.jp

10. Obtaining a Visa

The first step in obtaining a visa is to apply for a Certificate of Eligibility at the Ministry of Justice, Immigration Bureau in Japan. On behalf of students who reside overseas, who have been accepted after the evaluation, and who are confirmed to have completed all the admission procedure requirements,

Akita University will apply for the Certificate of Eligibility upon the request of the student. Upon receipt of the Certificate of Eligibility from the Immigration Bureau, Akita University will then mail it to the student's address. The student is to submit their passport and the certificate to a Japanese diplomatic office (Japanese Embassy or Japanese Consulate) in their home country. A visa will be issued approximately one week after submitting the above documents.

Note:

- a) Akita University International Exchange Center (hereafter referred to as the International Exchange Center) will request the residential status of "College Student" when applying for the Certificate of Eligibility upon the request of the student.
- b) Admission may be turned down by the student under unavoidable circumstances, but the student will be required to send the Certificate of Eligibility immediately back to the International Exchange Center along with a letter stating the reason for the cancellation.
- c) To ensure a prompt application process, applicants who commission the International Exchange Center to apply for the Certificate of Eligibility must make sure that all documents (explained below) are completely filled out and are submitted at the time of applying for the course. However, the immigration office may find it necessary to request additional documents.

Flow chart on how the college student visa is obtained:

- ① Submission of documents necessary for Certificate of Eligibility at the time of application for the course
(applicant → International Affairs Division)
- ② Completion of admission procedures after having been accepted
(accepted student → Admissions Office)
- ③ Application for Certificate of Eligibility
(International Affairs Division → Sendai Regional Immigration Bureau)
- ④ Issuance of Certificate of Eligibility
(Sendai Regional Immigration Bureau → International Affairs Division)
- ⑤ Mailing of Certificate of Eligibility
(International Affairs Division → accepted students)
- ⑥ Applying and obtaining of college student visa in the students' home country.
(accepted student → Japanese Embassy or Japanese Consulate)
- ⑦ Entry into Japan under college student status

Application Documents for Certificate of Eligibility

* Designated forms are available.

		Documents	No.of copies	Notes
*	(1)	Application for Certificate of Eligibility	1	Application forms and instructions are found at the Ministry of Justice website
*	(2)	Photo (40mm x 30mm)	1	The same photo used on the application form for the course must be pasted on the designated place of the Application for Certificate of Eligibility form.
	(3)	Copy of passport (if issued)	1	All the pages where the applicant's information is entered must be photocopied and submitted.
	(4)	Bank statement of your supporter	1	Please submit a certificate for everyone if there are multiple financial sponsors.

For any questions about a certificate of eligibility:

Akita University International Affairs Division

1-1, Tegata Gakuen-machi

Akita-shi 010-8502 Japan

Tel.: +81-18-889-2258

E-mail: ryugaku@jimu.akita-u.ac.jp

Graduate School Outline

1. Organization

The Graduate School of Engineering Science consists of a two-year Master's Degree Program and a three-year Doctor's Degree Program.

The Master's Degree Program consists of 5 departments (8 courses), the Doctor's Degree Program consists of 1 department (4 fields). The 5 departments in the Master's Degree Program are related to the 4 departments in the undergraduate program.

[Master's Degree Program]

Department (Major)	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	

[Doctor's Degree Program]

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

2. Master's Degree Program Department Outline

《Department of Life Science》

The results of research in the life sciences have led to breakthroughs that brought about many new advances in science and technology, as these fields can be seen as carving out the future of human society. This department therefore seeks to develop scientists able to unravel the elaborate workings of life phenomena; human resources who will play core and leading roles in their future professions taking advantage of their high level of knowledge, insight, and research skills in life science; and human resources who, with their grounding in science, will lead research and development in cross-disciplinary and academic fields related to medicine, pharmacology, engineering, agriculture, and other areas, and be active in many different fields related to life science including medicine, pharmaceuticals, food production, and development of bioenergy resources.

1) Life Science Course

This course consists of the Biomolecular Chemistry field, covering areas including structural biology, protein chemistry, analytical chemistry, supramolecular chemistry, organic chemistry, electrochemistry, and computational chemistry, and the Molecular Cell Biology field covering areas such as biochemistry, molecular biology, cell biology, and disease biology. In addition to helping students systematically acquire fundamental knowledge in both fields, the course fosters engineers and scientists capable of independently pursuing research and development based on a high level of specialized expertise.

Course	Life Science		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Chemistry and Chemical Biology	Structural and functional analyses of industrially and/or medically important proteins; Total synthesis of biologically active natural products; Development of nanotechnology oriented bioelectrochemical devices; Exploiting sensing techniques for biomolecules and biological calls.	Prof. Masafumi Odaka	Advanced Biological Inorganic Chemistry
		Associate Prof. Yoshiaki Amatatsu	Advanced Theoretical Life Science I, II
		Prof. Kenshu Fujiwara	Synthetic Medicinal Chemistry I, II
		Associate Prof. Uichi Akiba	Advanced Bio-Electronic Chemistry I, II
		Associate Prof. Hirotooshi Matsumura	Advanced Analytical Spectroscopy I, II
		Associate Prof. Yoshihiko Kondo	Advanced Structural Organic Chemistry I, II
Molecular Cell Biology	Characterization of Disease Oriented Genes and Proteins, and Study of Physiological Functions of Molecular Chaperones in Protein Folding; Studies on immune responses and molecular physiology in the immune cells.	Prof. Hiroshi Kubota	Frontier in Cell Biology
		Prof. Masaki Hikida	Molecular Cell Physiology Practical approach for gene control
		Prof. Hideki Wakui ㉔	Advanced Biology of Disease
		Lecturer Kaori Fujita	Molecular Cell Regulation Science I, II

㉔ This professor will retire by the mandatory retirement regulation in March 2022.

《Department of Materials Science》

Today, as energy problems, environmental degradation, resource depletion, and other global issues become increasingly severe, demands are heightening for technology development toward the promotion of green innovation and highly efficient infrastructure systems. The role to be played by materials science, based on applied chemistry and on materials science and engineering, is becoming more important than ever before. Responding to these needs of society, it is essential that we bring together scientific knowledge across the basic fields of physics, chemistry, and mathematics, pursuing the limits of the potential in materials while aiming to create new materials and functions. This department develops engineers, scientists, and educators equipped with a strong sense of ethics, who are able to deal with various issues relating to materials science facing modern society. The department consists of the Applied Chemistry Course and the Materials Science and Engineering Course, playing a closely interrelated role in the education and research of the Graduate School.

1) Applied Chemistry Course

With chemistry-related knowledge as a foundation, the necessary curriculum is provided for linking material design and synthesis from the atomic and molecular level to creation of original materials. Human resources are fostered who can exercise agility in creating environmentally harmonious materials, such as through the development of new functional materials, effective use of chemical energy in recycling and regeneration, and advanced use of biological functions, and in conducting research and development on leading-edge technologies.

2) Materials Science and Engineering Course

Based on materials science and materials engineering, the necessary curriculum is provided for gaining practical experience in creating new materials and new functions, with the main focus on metals, semiconductors, and ceramics. In this way, human resources are fostered who are able to clarify the expression mechanisms of material properties based on simulations and on organizational and structural analysis from the nanoscale to the macro scale, and to contribute to developing technologies for producing and manufacturing next-generation functional materials in harmony with human society.

Course	Applied Chemistry		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Chemistry of Organic Materials	Synthesis and Properties of Organic Functional Materials	Prof. Mitsutoshi Jikei	Advanced Molecular Science and Technology
		Associate Prof. Kazuya Matsumoto	Functional Polymer Chemistry I, II
Applied Physical Chemistry	Design and Application of Environmental Advanced Materials from the Viewpoint of Physical Chemistry	Prof. Kenji Murakami	Advanced Surface Chemistry I, II
Inorganic Materials Chemistry	Synthesis and Characterization of Inorganic Advanced Materials such as Porous Material, Catalytic Materials and Ceramics	Prof. Sumio Kato	Advanced Inorganic Materials Chemistry
		Associate Prof. Masataka Ogasawara	Advanced Characterization of Inorganic Materials
Functional Surface Chemistry	Surface Processes for Environments and for a Production of Value-added Materials with Specific Functions	Prof. Takayoshi Shindo ㉓	Advanced Organic Resources Chemistry I, II
		Lecturer Yukihiko Inoue	Chemistry of Polymer Functionalities
Applied Analytical Chemistry	Solution, Spectrum and Nuclear Chemistry for Analytical Chemistry and It's Application for Environmental Science	Prof. Yoshihiro Iwata (Faculty of Education and Human Studies)	Advanced Analytical Chemistry I, II
Organometallic Chemistry	Development of Transition Metal Complex Catalysts Utilized for Organic Syntheses and Bio-inspired Methods of Molecular Transformation	Associate Prof. Hidetake Seino (Faculty of Education and Human Studies)	Advanced Organometallic Chemistry
Chemical reaction Engineering	Design, Optimization, Prediction and Sophistication of Chemical Processes by Means of Advanced Numerical Analysis Based on a Methodology of Systematic Fusion of Chemical Reaction Engineering, Transport Phenomena and Chemical Thermodynamics		Advanced Transport Phenomena I, II
Chemical Engineering	Design and Development of Chemical Processes	Associate Prof. Hiroshi Takahashi (Cooperative Major in Sustainable Engineering)	Process Design Engineering
Energy Chemical Engineering	Process Design of Heterogeneous Reaction for Efficient Utilization of Energy and Resources	Associate Prof. Hirokazu Okawa	Advanced Electrochemistry
		Lecturer Takahiro Kato	Energy Chemical Engineering I, II
Bioprocess Engineering	Bioprocess design and development by integrating biological and biochemical technologies, and creation and application of new functional biomaterials	Prof. Takeshi Gotoh	Nanobiotechnology
Supramolecular and Material Chemistry	Education and research for design of macrocyclic and acyclic compounds having molecular recognition capability and its functionality of molecular assembly	Lecturer Manabu Yamada	Molecular Recognition Chemistry

㉓ This professor will retire by the mandatory retirement regulation in March 2023.

Course	Materials Science and Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Physical Properties of Materials	Research and Education on the Structural Analysis of Materials and the Development of Structural and Functional Materials by Microstructure Control	Prof. Kaichi Saito	Diffraction Physics I, II
Computation of Materials	Research and Education of Materials Computation Based on Molecular Orbital Method and Molecular Dynamics Method	Associate Prof. Yoshiyuki Sato (Cooperative Major in Sustainable Engineering)	Materials Computation for Molecules I, II
Ceramic Materials	Physical, Mechanical and Electrical Properties of Ceramics and Their Application to Energy Generation and Use	Associate Prof. Akihiro Nino	Physical and Mechanical Properties of Ceramics Materials I, II
Mechanics of Materials	Evaluation of Structure and Mechanical Properties and Material Design for Plastic Base, Metal Base and Ceramic Base Composites	Prof. Ken-ichi Ohguchi	Mechanics of Composite Materials I, II
Fabrication Engineering of Inorganic Materials	Fabrication Processes, Microstructural Control and Evaluation of Inorganic Materials via Powder Processes	Prof. Shigeo Hayashi	Design of Inorganic Materials I, II
Physical Properties of Solids	Research and Education on the Atomic Structure and Physical Properties of Metals and Alloys	Lecturer Yeong-Gi So	Physical properties of Solids I, II
Microstructure Design of Materials	Education and Research on Numerical Simulation for Structure Formation	Associate Prof. Yukinobu Natsume	Microstructure Design of Materials I, II
Surface Modification	Modifying Process for the Functional Surface of Materials	Associate Prof. Michihisa Fukumoto	Surface Modification I, II
Thin Film Materials	Fabrication and Evaluation of Thin Film Materials for Electronic Device Application	Prof. Satoru Yoshimura	Physical Properties of Thin Film Materials I, II
Molecular Electronics	Education for Understanding into the Basic Concepts Involved in the Field of Molecular Electronics, and Research on Phenomenon Concerning about Electron and Photon in Molecular Structure and Their Assembly, by Understanding of the Electrical Conduction in Single-Molecule Circuits, and by Introducing to the Experimental Techniques and Theoretical Concepts.	Lecturer Yutaka Tsujiuchi	Molecular Electronics I, II
Magnetic Materials	Development of Nano Magnetic Materials and Thin Films	Lecturer Takashi Hasegawa	Applied Magnetics I, II
Material Science with Quantum Beams	Research and Education on the Development of Phosphor Materials for Radiation Measurements	Lecturer Naoki Kawano	Material Science with Quantum Beams I, II
Electrochemistry of Materials	Education and Research on the Electrode Materials in Electrochemical System	Lecturer Hiroki Takahashi	Materials for Electrochemistry I, II
Foundry Engineering	Education and Research on Fusion and Solidification Processing for Highly Functional Materials	Lecturer Ikuzo Goto	Fusion and Solidification Processing I, II

《Department of Mathematical Science and Electrical-Electronic-Computer Engineering》

The human resources to be developed in this department include those who will contribute to the advance of basic industries, solutions to energy problems, and harmony between humans and computers, driving revolutions in technology development, as well as educators and others equipped with highly specialized knowledge, skills, and insight in mathematics, theoretical physics, and computer science, and with advanced knowledge in the field of mathematical science.

Also to be fostered are human resources able to develop technologies for solving regional issues faced by Akita Prefecture with its advanced state of aging, and to communicate these to the world. In addition, they will acquire the skills for exercising leadership based on recognition of the importance of teamwork, and for dealing with unanticipated problems. That is, human resources will be fostered who, with their overview of the enormous specialized knowledge in the fields of mathematical science, electrical and electronic engineering, and computer engineering, are able to create new technologies and value for a highly aging society.

1) Mathematical Science Course

Education and research are carried out concerning advanced mathematical concepts and structures, and for clarifying and investigating the mathematical structures of physical and other phenomena. In this course whose main features include a focus on a systematic curriculum and qualifying examinations, students study advanced mathematics and related areas in order to acquire the ability to solve problems by logical thinking and from a mathematical science perspective.

2) Electrical and Electronic Engineering Course

Along with studies for systematically understanding knowledge in a wide range of specialized fields including electrical energy and equipment, electronics, photonic and electronic devices, and information communications and systems control, students engage in research for creating new applications and technologies by focusing on a particular field or integrating these fields. Through this experience, human resources are developed with creative thinking and flexible application skills.

3) Human-Centered Computing Course

The Human-Centered Computing Course develops human resources who, majoring in computer engineering, are equipped with creative thinking and flexible application skills enabling (i) the use of information and communication technologies (ICT) for supporting healthy longevity and home healthcare of the elderly in regional society, (ii) advancement of technologies and development of application systems related to environmental monitoring, disaster prevention and mitigation, and human sensing, and (iii) use of information networks, ICT, and other tools for realizing a safe and secure society.

Course	Mathematical Science		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Discrete Mathematics	Algebra, Discrete Mathematics, Foundations of Computer Science and their Applications	Prof. Akihiro Yamamura	Advanced Algebra I, II, V, VI
		Associate Prof. Szilard Fazekas	Advanced Discrete Mathematics I, II
Continuous Mathematics	Analysis, Geometry, Topology and their Applications	Prof. Hajime Kawakami	Advanced Analysis I, II, IV, VI
		Associate Prof. Mahito Kobayashi	Advanced Geometry I, II Advanced Topology III, IV
		Lecturer Yasuharu Nakae	Advanced Topology I, II
Theoretical Physics	Fundamental Theories for Phase Transition and Transport Phenomena in Quantum Many-Body Systems such as Electron Systems in Solids and their Applications to Novel Phenomena.	Prof. Masaru Onoda	Quantum Many-Body Theory I, II
		Associate Prof. Yasunari Tanuma	Condensed Matter Physics III, IV
High-temperature physical properties of matter	Experimental and theoretical studies on high-temperature properties of molten oxides and applications to design and production process of environmentally friendly amorphous materials	Associate Prof. Toru Sugawara (Cooperative Major in Sustainable Engineering)	High-temperature physical properties of matter

Course	Electrical and Electronic Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
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	Prof. Seiji Kumagai	Advanced Materials for Electrical Engineering I, II
		Prof. Katsubumi Tajima (Cooperative Major in Sustainable Engineering)	Electromagnetic Energy Conversion Engineering
		Associate Prof. Takeshi Miura (Cooperative Major in Sustainable Engineering)	Advanced Control System Engineering I, II
		Associate Prof. Mahmudul Kabir	Bio Electromagnetic Engineering I, II
		Lecturer Yukihiro Yoshida (Cooperative Major in Sustainable Engineering)	Advanced Electrical Machinery I, II
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	Prof. Hitoshi Saito	Advanced Electronic Materials I, II
		Prof. Rumiko Yamaguchi	Electronic Display Engineering I, II
		Associate Prof. Yuichi Sato	Advanced Semiconductor Device I, II
		Associate Prof. Motoshi Tanaka	Advanced Communication Engineering I, II
		Associate Prof. Marenori Kawamura	Optical Device Engineering I, II
		Associate Prof. Sho Muroga	Signal Processing for Instrumentation I, II
		Lecturer Makoto Fukuda	Applied Piezoelectric Device Engineering I, II
		Lecturer Shinichi Yodokawa	Advanced Ultra-High-Frequency Electronics I, II

If there is (Cooperative Major in LifeCycle Design Engineering) under the teacher's name, Desired Department (Major) is "Cooperative Major in LifeCycle Design Engineering".

Course	Human-Centered Computing		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Biomedical and Welfare Engineering	Study on Applied Evaluation and Welfare Support Systems for Elder People, Disabilities by Virtual Reality Technology and Design of Computer and Software Systems.	Prof. Kazutaka Mitobe	Sensory Information Engineering I, II Virtual Reality I, II
		Associate Prof. Katsuya Fujiwara	Software System
		Lecturer Sawako Nakajima	Well-being Information Engineering with Spoken and Natural Language Processing I, II
Image Information System Engineering	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.	Prof. Yoichi Kageyama	Image Information I, II Remote Sensing Engineering I, II
		Associate Prof. Chikako Ishizawa	Security System I, II
Spatial Informatics	Modelling, Data Management, Analysis, Sharing, Simulation and Human-Centered Design for the Real World and Spatial Information Communication	Prof. Masatoshi Arikawa	Spatial Informatics I, II
Information Network Engineering	Technologies for Improving Performance, Functionalities and Resiliency for Internet and Broadband Communication Networks	Associate Prof. Masashi Hashimoto	Advanced Information Network Engineering I, II
Computer System Engineering	Study on Dependable Computer Systems and Design of Testable Logic Circuits	Associate Prof. Hiroshi Yokoyama (Center for Information Technology and Management)	Advanced Digital Logic Design I, II

《Department of Systems Design Engineering》

In parallel with rapid advances in science and technology, society is facing problems such as global warming from CO₂ emissions and the need to develop renewable energy sources. Here the role of mechanical engineering is of growing importance, in such areas as improving the technologies needed to enhance the functionality of equipment. Meanwhile, in Japan there have been major advances in the aerospace field and in technologies for recycling of waste materials, while the need for creative engineering capable of creating and nurturing new industries has grown. The aging of society has also created an urgent need for technology advances, not only in the health and welfare area but in creating civil engineering technologies in harmony with the environment and improving the functions of urban and regional systems to build and maintain better communities.

The Department of Systems Design Engineering, through education and research on the design and development of these complex and large-scale systems, aims to nurture researchers, developers, and engineers equipped with fundamental knowledge in the specialized fields of mechanical engineering, creative mechanical engineering, and civil and environmental engineering, as well as having knowledge across the fields of system design, and who, with their accurate awareness of regional needs, are able to contribute to local society and to the world. To meet these aims, education and research are carried out in tandem in the following two areas.

1) 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.

2) Civil and Environmental Engineering Course

Research and education are aimed at acquiring advanced specialized knowledge in such areas as structural engineering, hydraulic engineering, geotechnics, urban and traffic engineering, and concrete engineering, and on this foundation to build up individual knowledge and skills for applying these to problem solving, while also fostering communication skills for cooperative problem solving, in order to contribute to formation of safe, reliable, and convenient infrastructure for society.

Course	Mechanical Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Aerospace System Field	Generation and Evaluation of Micro/Nano Materials, Solid Mechanics, Analysis on the Surface Structure and its Application, Theory and Practical Application of Heat Transfer and Fluid Flow, Material Exchange across Functional Membranes, Multibody Dynamics, Identification of Nano-structure of solid surface using AFM, and its Application to Electric-driven, Highly Efficient and Low Environmental Impact Technologies of Transportation Machineries	Prof. Mikio Muraoka	Overview of Nanotechnology for Mechanical Systems Introduction to Fundamental Physics for Aircraft Systems Engineering
		Prof. Takahiro Adachi	Advanced Course for Fluid Dynamics
		Associate Prof. Makoto Yamaguchi	Characterization of Subsurface Structure
		Associate Prof. Takeshi Akinaga (Cooperative Major in Sustainable Engineering)	Modelling and Simulation of Technical and Physical Systems
		Lecturer Hiroshi Hirayama (Cooperative Major in Sustainable Engineering)	Aircraft System Control
		Lecturer Yukinori Kinoshita (Cooperative Major in Sustainable Engineering)	Nano-scale Advanced Engineering of Measurement Systems
		Lecturer Xu Zhao	Advanced Thin-film Material Engineering
Medical System Engineering Field	Controller Design for Mechatronics Devices with Sensors and Actuators, Human Motion Measurement and Analysis of its Mechanism, Applications of Magnetic Fluids in Medicine, the Influence of Surface Environment in Microfabrication and Biomaterials, and its Applications to Medical and Welfare Engineering	Prof. Akihiro Naganawa	Advanced Control Engineering I, II
		Prof. Takehiro Iwami	Healthcare Motion Sensing Clinical Biomechanics
		Associate Prof. Yoshiyuki Yamamoto	Advanced Applied Electromagnetism Physical Properties of Living Organisms
		Associate Prof. Mamoru Takahashi	Micro Processing Biomaterial Processing
		Associate Prof. Yoshihiro Sasaki	Actuator Engineering I, II
		Lecturer Takeshi Seki	Design of Digital Control Systems Optical and AI Therapeutic Engineering
Environmentally Friendly System Field	Ice Melting and Water Freezing, Theory and Application of Renewable Energy Conversion, Basic Study for Rarefied Gas Dynamics and its Application, Measurements for the Mechanical Design, Environmental Benign Joining Technologies, Renewable Energy Technologies based on the regional potential and its Application to Sustainable Mechanical Engineering	Prof. Makoto Tago ㉓	Advanced Natural Convection Heat Transfer I, II
		Prof. Eiki Okuyama	Ultraprecision Mechanism Design I, II
		Prof. Nozomu Mishima (Cooperative Major in Sustainable Engineering)	Life Cycle Design Engineering Basics
		Associate Prof. Yoshimi Komatsu	Computational Thermodynamics and Fluid Dynamics
		Associate Prof. Yasuyuki Miyano	Advanced Technology for System Design I, II
		Associate Prof. Takaaki Furubayashi (Cooperative Major in Sustainable Engineering)	Special Theory on Regional Energy Systems
		Lecturer Wataru Sugiyama	Kinetic Theory for Molecular Gas

㉓ This professors will retire by the mandatory retirement regulation in March 2023.

Course	Civil and Environmental Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Structural Mechanics	Linear and Nonlinear Mechanics and Theory of Structural Design of Steel and Timber Structures	Prof. Humihiko Gotou	Advanced Structural Mechanics
Hydraulics and Hydraulics Engineering	Measurements and Numerical Modeling of Natural Disaster in rivers and coastal area	Associate Prof. Kazuya Watanabe	Coastal and river Engineering
Soil Mechanics and Geotechnical Engineering	Physicochemical and Mechanical Properties of Soft Soil	Associate Prof. Toshihiro Ogino	Advanced Soil Mechanics
Urban and Traffic Planning	Methods, and Analytical Techniques used in Traffic Engineering and Planning	Prof. Hidekatsu Hamaoka	Advanced Traffic Engineering
	Philosophy, Methods, and Analytical Techniques used in Urban and Traffic Planning with emphasis on the Logic and Assumption on which these are based	Associate Prof. Satoru Hino	Advanced Urban Planning
Concrete Engineering	Design of Construction Materials, Maintenance of Concrete Structures and Structural Analysis for Concrete Structures	Prof. Hidenobu Tokushige	Construction Material Design Advanced Structural Design

《Cooperative Major in Sustainable Engineering》

Industrial development has brought about economic growth and technological innovation, and production activities have increased the emission of greenhouse gases such as carbon dioxide, causing global climate change such as global warming and torrential rains, and industrial waste from factories has destroyed the natural environment. The unplanned consumption of energy resources threatens the future survival of society. Greenhouse gases and industrial wastes are undesirable effects of human activities and are considered as environmental burdens that cause problems in environmental conservation, and it is the responsibility of mankind to manage them in a rational manner. In 2015, the United Nations Summit adopted the "2030 Agenda for Sustainable Development" and the Sustainable Development Goals (SDGs). Japan has also set a policy goal of achieving carbon neutrality by 2050, and in the future, industrial technologies that reduce the environmental burden and form a sustainable society while maintaining economic growth will be emphasized. Industry can reduce its environmental impact through environmentally conscious design (life cycle design) that considers the environmental impact of products throughout their life cycle, from resource extraction to refining, transportation, manufacturing, use, and disposal (recycling and reuse), and by rationalizing energy use. In the future, it will be necessary to break away from the industrial technology that was suitable for the industrial revolution and the subsequent era of mass production and mass consumption, and to develop environmentally friendly design throughout the industrial world to enable a sustainable society. In particular, we will promote the electrification of power systems to break away from dependence on fossil fuels for mobile vehicles. The potential for renewable energy in the Akita region is high, and the development of the region will also require the advancement of technology to realize the rationalization of energy use. The study that aims to develop new industrial technology based on environmentally friendly design that promotes production activities while taking the environment into consideration, as well as breaking away from dependence on fossil fuels and the rational use of renewable energy, will be called Sustainable Engineering. The Cooperative Major in Sustainable Engineering has been established as a joint graduate school of Akita University and Akita Prefectural University based on such social needs, and aims to contribute to the sustainable development of the region through education and research in sustainable engineering, and to contribute to the reduction of environmental load and the promotion of industry in Japan and the region by acquiring advanced expertise in sustainable engineering.

The Cooperative Major in Sustainable Engineering aims to bring harmony between the environment and social systems by reducing the environmental load through education and research in the fields of electrification of power systems, environmentally friendly design, and renewable energy utilization in sustainable engineering, and to achieve sustainable development in Japan and the region. However, since the amount of knowledge to be acquired is enormous, specialization will be given to the main education and research fields of electrification of power systems in mobility and environmentally friendly design and use of renewable energy, with the former set as the Electromobility Course and the latter as the Social Environment Systems Course.

Main Features of the Cooperative Major in Sustainable Engineering, and Matters to Note in Taking Entrance Exam

1. The degree granted carries the names of both Akita University and Akita Prefectural University.
2. Students are resident in both Akita University and Akita Prefectural University, but the official university of residence is that of the main supervisor providing primary research guidance.
3. Because students are enrolled in both Akita University and Akita Prefectural University, they can use the facilities and resources of both universities. (Some facilities and resources may not be available due to circumstances of each university.)
4. When the official university of residence is Akita University, research guidance may be received also from sub-supervisors of Akita Prefectural University.
5. Classes taken are those of the joint graduate school consisting of Akita University and Akita Prefectural University.
6. If the faculty member desired as the main supervisor belongs to Akita University, the student makes application to Akita University and takes the entrance examination given by Akita University. In this case, the official university of residence after admission to the major is Akita University, and payment of tuition and charges as well as application for scholarships, etc., is made as a student of Akita University.

Note that for this major it is not possible to apply to both Akita University and Akita Prefectural University.

Course	Electromobility		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Heat and Fluid Flow, Atomization, Two-phase flow, Heat Exchanger	Environmental Control System for electric aircraft, Fluid Dynamics and Heat Transfer	Prof. Takahiro Adachi	Advanced Course for Energy of Heat and Fluid Flow
Electromagnetic Energy Conversion Engineering	Development of new machines and improvement of conventional machines for electromagnetic energy conversion	Prof. Katsubumi Tajima	Electromagnetic Energy Conversion Engineering
Stability and transition in shear flows, Heat and mass transfer, Biofluid mechanics	Hybrid laminar flow control for airfoils, Seawater greenhouses for SDGs, Inertial migration in particle-laden flows	Associate Prof. Takeshi Akinaga	Integrated modeling and simulation for design optimisation
Control Engineering, System Engineering	Mathematical Model Construction and Development of Analysis Methods for Various Systems	Associate Prof. Takeshi Miura	Advanced Control System Engineering I, II
Measurement Engineering	Development of surface analysis techniques for revealing quantitative surface nano-scale physical properties on advanced electronic/magnetic materials	Lecturer Yukinori Kinoshita	Advanced mechanical measurement
Aerospace Engineering	Electric aircraft control, Aerospace dynamics, Spacecraft, Space exploration, Space debris	Lecturer Hiroshi Hirayama	Aircraft system control
Electromechanical Energy Conversion	Analysis and design of magnetic devices in electric drive systems	Lecturer Yukihiro Yoshida	Modelling and Analysis of Electrical Machinery I, II

Course	Social Environment Systems		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Life Cycle Design Engineering (Design Engineering, Quality Engineering, Value Engineering)	Design methodology studies and eco-efficiency analysis of products or product service systems considering the life cycles	Prof. Nozomu Mishima	Life cycle design engineering basics
Computation of Materials	Research and Education of Materials Computation Based on Molecular Orbital Method and Molecular Dynamics Method	Associate Prof. Yoshiyuki Sato	Materials Computation for Molecules I, II
High-temperature physical properties of matter	Studies of fundamental properties of inorganic high-temperature materials, and their applications to high-level radioactive waste treatment and environmentally friendly glass production	Associate Prof. Toru Sugawara	High-temperature physical properties of matter
Chemical Engineering (Unit operation, Separation engineering)	Development of novel chemical processes for resources and their systematization using IoT technology	Associate Prof. Hiroshi Takahashi	Chemical Process Design
Earth Science (Petrology, Geochemistry, Isotope chemistr)	Research of mass transfer and chemical reaction in the earth Environmental system, Development of analytical techniques	Associate Prof. Mayuko Fukuyama	Earth and Environmental analytical science
Energy systems analysis	Design and analysis of the regional energy systems consisting of resources, conversion technologies, and demand for a sustainable decarbonized society	Associate Prof. Takaaki Furubayashi	Special Theory on Regional Energy Systems

3. Requirements for Completion of the Master's Course

A Master's degree is awarded if the student has satisfied the following requirements: have at least two years' residence in the Master's program; acquire a minimum of 30 course credits shown in the chart below; have an acceptable Master's thesis; pass the final comprehensive examination.

Students who demonstrate exceptional achievement may receive the degree with a residence period of as short as 1 year.

Credits Needed for the Completion of the Master's Program (Except the Cooperative Major in Sustainable Engineering)

Courses	Credits Required	Remarks
Common Subjects	3 credits (required)	
Specialized Subjects	13 credits (required)	
Common Subjects and Specialized Subjects	A minimum of 14 credits (elective)	A minimum of 10 credits in the major and a minimum of 2 credits from other majors.
Total	A minimum of 30 credits	

Credits Needed for the Completion of the Master's Program (For the Cooperative Major in Sustainable Engineering)

Courses	Credits Required	Remarks
Specialized Subjects	15 credits (required)	
Common Subjects and Specialized Subjects	A minimum of 15 credits (elective)	(1) Students in each course must take at least one credit from the foreign language courses of the common subjects or Aero-Space Engineering I and II of the specialized subjects, and at least one credit from the ethics courses. (2) Students in the Electromobility course must take at least 4 credits from Transportation and Mechanical Systems and at least 4 credits from Elemental Technology. (3) Students in the Social Environment Systems course must take at least 4 credits from Design for Environment (Life Cycle Design) and 4 credits from Renewable Energy. (4) Up to 2 credits of courses taken in other departments of both graduate schools can be included in the 30 credits required for completion.
Total	A minimum of 30 credits	

Master's Course
2022 April (Spring) Admission
Affiliated School Recommendation
Graduate School of Engineering Science, Akita University
Application for Admission

Admission Category	2022 April Admission	Application No.	※
Name of Applicant			
Date of Birth	_____ / _____ / _____ month day year		
Sex	Male / Female		
Application Qualification			
Desired Department (Major)			
Desired Course			
Desired Supervisor	Cooperative Major in Sustainable Engineering only		
Current Address	Address: _____ Tel.: _____ postal code country Mail address: _____		
Educational and Employment History			

Note:

1. ※ Official use only.
2. Please use BLOCK LETTERS and BLACK INK
3. Please read the Admission Guidelines carefully and enter all the information requested.
4. Contact Address is where applicant wishes to receive correspondence.
Any changes must be reported immediately.

Master's Course
2022 April (Spring) Admission
Affiliated School Recommendation
Graduate School of Engineering Science
Akita University

ID Photo Card

Classification	Recommendation by Affiliated School
Admission Category	2022 April Admission
Application No.	※
Name	
Desired Field	
<div style="border: 1px dashed black; padding: 10px; width: fit-content; margin: 0 auto;"><p>Please paste ID photo. (4.5cm x 3.5cm) Upper frontal view of applicant without a hat.</p></div>	

Note:

1. ※Official Use Only
2. Photo must be taken within 3 months prior to application.

Proof of Evaluation Fee Payment Form

Application Number:※

Applicant's Name:

Desired Graduate School:

Desired Department (Major):

Please paste
Proof of Payment for Evaluation Fee

- Note: 1. ※Official Use Only
2. Please make sure the Proof of Payment is securely pasted and the date of payment is visible.