

Doctoral Courses
2016 April (Spring) Admission
Affiliated School Recommendation

Application Guidelines

Application Period:
October 22, 2015 — October 30, 2015

Akita University
Graduate School of Engineering Science

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

Overseas Affiliated Universities

Akita University is actively working with international exchange activities.

Inter-University Agreements 57 Universities (29 Countries and Regions) As of Aug 17, 2015

Countries, Regions	Universities	Date of Conclusion
India	Indian Institute of Technology Madras	Mar 21, 2014
	VIT University	Jun 12, 2015
Indonesia	Institut Teknologi Bandung	Jul 12, 2012
	Trisakti University	Jun 10, 2014
	Universitas Gadjah Mada	Jun 8, 2015
Korea	Hanbat National University	Jun 8, 2001
	Wonkwang University	Oct 12, 2007
	Kangwon National University	Mar 24, 2008
Thailand	Faculty of Science, Chulalongkorn University	Nov 28, 2012
	Suranaree University of Technology	Aug 17, 2015
Taiwan	Lunghwa University of Science and Technology	Jul 15, 2005
China	Heilongjiang University	Oct 19, 1988
	China Medical University	Oct 6, 1989
	Central South University	Aug 24, 2004
	Liaoning Technical University	Apr 20, 2005
	Dalian Nationalities University	Jun 27, 2005
	Lanzhou University	Aug 1, 2005
	Xinjiang Medical University	Feb 20, 2006
	Jilin University	Feb 6, 2007
	Northeastern University	Aug 9, 2007
	Donghua University	Dec 3, 2009
	Tongji Medical College Huazhong University of Science and Technology	Mar 24, 2010
	Chang'an University	Nov 18, 2010
	Beihua University	Nov 20, 2012
Jiaxing University	Nov 12, 2014	
Philippines	University of the Philippines Diliman	Sep 24, 2012
	University of the Philippines Manila	Feb 4, 2013
Bhutan	Royal University of Bhutan	Jul 6, 2012
Vietnam	Hanoi University of Science and Technology	Dec 2, 2008
	University of Transport and Communications	Dec 3, 2008
Malaysia	University of Malaya	Nov 20, 2013
Myanmar	University of Yangon	Sep 19, 2014
Mongolia	Mongolian University of Science and Technology	Oct 22, 2009
	Ikh Zasag University named after Chinggis Khaan	Jul 22, 2010
	Mongolian State University of Education	Jul 23, 2010
	Mongolian National University	Jun 19, 2013
Israel	University of Haifa	Sep 24, 2010
Botswana	Botswana International University of Science and Technology	Oct 23, 2009
	University of Botswana	Mar 31, 2011
Kenya	Kenyatta University	Mar 2, 2010
Mozambique	Universidade Eduarde Mondlane	Jan 12, 2014
Republic of South Africa	The University of The Witwatersrand	Sep 1, 2014
Australia	Griffith University	Jun 29, 1996
	Curtin University	Aug 1, 2013
USA	St. Cloud State University	Jul 24, 1996
	Missouri University of Science and Technology	Mar 7, 2011
Canada	Memorial University of Newfoundland	Jun 17, 2013
Chile	Universidad de Santiago de Chile	Nov 21, 2013
Italy	University of Cagliari	Dec 9, 2009
	University of Ferrara	Jun 30, 2014
Netherlands	University of Twente	Oct 23, 2007
Kazakhstan	East Kazakhstan State Technical University	Jun 8, 2011
Sweden	Lulea University of Technology	May 9, 2013
Germany	Technische Universität Bergakademie Freiberg	Jul 4, 2012
Finland	Lapland University of Applied Sciences	Oct 23, 2009
Belarus	Belarussian State Medical University	Jul 26, 2004
Romania	University of Bucharest	Sep 28, 2010

Inter-Faculty Agreements 17 Faculties (9 Counties and Regions) As of Jun 12, 2014

Faculties	Countries, Reijions	Faculties, Universities	Date of Conclusion
Faculty of International Resource Sciences	Indonesia	Faculty of Engineering, Hasanuddin University	Apr 23, 2014
Graduate School of Medicine	China	Beijing Hospital, Ministry of Health	Nov 14, 1995
	France	The Faculty of Medicine of Lille 2 University	Apr 13, 2011
Akita University Hospital	China	The First Hospital of Lanzhou University	Jun 12, 2014
Graduate School of Engineering Science	Thailand	Faculty of Engineering, Chiang Mai University	Jul 12, 1999
		Faculty of Science, Chiang Mai University	Jul 12, 1999
	Taiwan	College of Engineering, Minghsin University of Science and Technology	Apr 12, 2010
	China	Department of Precision Instruments and Mechanology, Tsing Hua University	Mar 1, 2007
		Department of Chemistry, Tsing Hua University	Jan 17, 2008
		School of Materials Science and Engineering, Tongji University	May 24, 2010
		Shanghai Key Lab of D&A for Metal Functional Materials, Tongji University	May 24, 2010
	Zambia	School of Mines, University of Zambia	Jan 20, 2003
		School of Engineering, University of Zambia	Mar 12, 2003
	Tunisia	Faculty of Technology, University of Sfax	Dec 18, 2003
New Zealand	Auckland University of Technology	Nov 27, 2012	
USA	Montana College of Mineral Science and Technology	Jun 24, 1982	
Venture Business Laboratory	China	Shanghai Key Lab of D&A for Metal Functional Materials, Tongji University	Sep 2, 2011

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Akita University

Application Guidelines

The Doctoral Courses are offered by Akita University Graduate School of Engineering Science to exchange students having a recommendation from one of Akita University's overseas affiliated schools, and who are either currently enrolled or have graduated from it. These courses provide the students with the opportunity to obtain a Doctor's Degree in either Science, Engineering Science or Engineering.

1. Number to be Admitted

Field	Fall	Spring
Life Science	a few	a few
Materials Science	a few	a few
Mathematical Science and Electrical-Electronic-Computer Engineering	a few	a few
Systems Design Engineering	a few	a few

2. Application Qualifications

- The status of residence of a incoming student must be "College Student."
- Applicants must have received higher education in the field of their desired major and meet all academic requirements. They need to be people of integrity and must be recommended by the president of an affiliated school or the dean of the graduate school (or the dean of the faculty) attended. One of the three qualifications below must also be satisfied and enrollment at Akita University must also be promised once the candidate is accepted.
 - (1) Either have already obtained a Master's Degree or its equivalent or will be able to receive it by the end of March, 2016.
 - (2) Have, upon graduation from a college, engaged in research no less than 2 years at an affiliated university or its research institute, and have also been recognized by the Graduate School of Akita University as having an academic level equivalent to or higher than a Master's Degree based on the results of said research.
 - (3) Be 24 years of age or older on March 31, 2016, and be recognized to have an academic level that is equivalent to or higher than a Master's Degree after the Individual Application

Qualification Evaluation conducted by the Graduate School of Akita University (Applicant must have engaged in work no less than 2 years upon graduation from an affiliated university in such fields as science or engineering. Applicant must also have been acknowledged by the Graduate School of Akita University to have achieved the academic equivalent of a Master's Degree thesis or higher in such forms as books, papers, presentations, reports, or patents.)

Note :

- a) Applicants who are accepted based on the qualifications above, yet are 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.
- b) Applicants applying under requirements (2) or (3) of the Application Qualifications must submit the following documents to the Admissions Office of the Graduate School of Akita University for Pre-evaluation of Application Qualification. The request will be accepted starting on September 28, 2015, and no later than October 2, 2015 ① Pre-evaluation Request for Application Qualification, ② Academic Record for Approval of Application Qualification, ③ Record of Academic Achievements (forms ①-③ attached herein), ④ Proof of Graduation/Completion, and ⑤ copies of published papers
- c) Applicants will be notified of the Application Qualification Pre-evaluation results no later than October 19, 2015.

3. Application Period and Mailing Address

(1) Application Period:

From October 22, 2015 to no later than October 30, 2015.

- 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. "Application to Doctoral Course (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 30, 2015. 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 at the affiliated school where applicant is either currently attending or where graduated from, and must be issued by the president of the school or the dean of the graduate school.

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 the application must be pasted in the designated area for the ID photo Card (attached herein).

④ Certificate of Completion or Prospective Completion or Certificate of Graduation

Applicants who, either have or will be able to get a Master's Degree must submit a certificate of either completion or prospective completion of the Master's Course issued by the university or the graduate school last attended. Applicants having completed undergraduate work only, must submit a graduation certificate issued by the university or the faculty last attended.

⑤ Academic Record Transcripts

Official transcripts in a sealed envelope from the university or the faculty attended must be submitted.

⑥ Abstract of Master's Thesis

An abstract must be written on the form (attached herein) using 500 or less words. In the case of an applicant with a prospective completion of a Master's Course, the title of the Master's Thesis and an outline of the research process must be entered on the form. If papers, academic presentations, or patent licenses are available in print, a copy of such should also be enclosed.

(Not needed if applying under requirements (2) or (3) of the Application Qualifications.)

⑦ Research Plan

The desired field or topics for study must be explained in the outline of the research plan on the form (attached herein) in 300 or less words *upon consultation with the supervising professor whom the applicant wishes to study under.*

⑧ Record of Academic Achievements

Books, papers, academic presentations, patents, practical new designs, or other specific activities in academic societies or within the community, are to be explained on the form (attached herein).

⑨ 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 8, 2015 - October 30, 2015
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.

⑩ 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) Certificate of Graduation/Completion is not required if applying under requirements (2)

- or (3) of the Application Qualifications.
- b) No application will be accepted unless all documents mentioned above are fully and accurately completed.
 - c) Once submitted, documents will not be returned to applicants for any reason.
 - d) Applicants are not allowed to change majors after submission of application.
 - e) 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
 - f) 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 October 2, 2015. 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 October 2, 2015 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) The above requested information (items ①-⑥) are also requested if the applicant uses, on an everyday basis, such common tools as a hearing aid, crutches, or a wheelchair.

7. Acceptance Notification

Results are tentatively scheduled to be e-mailed to all applicants at 1:00 p.m on November 16, 2015.

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, 2015. If this Promise is not received by the deadline, it will be understood that enrollment will not take place.

9. Admission 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 his/her admission before March 31, 2016 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 these 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 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 his/her passport and the certificate to a Japanese diplomatic office (Japanese Embassy or Japanese Consulate) in his/her 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 International Exchange Center) will request the residential status of "College Student" when applying for the Certificate of Eligibility.
- 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 Exchange Center)
- ② Completion of admission procedures after having been accepted
(accepted student → Admissions Office)
- ③ Application for Certificate of Eligibility
(International Exchange Center → Sendai Regional Immigration Bureau)
- ④ Issuance of Certificate of Eligibility
(Sendai Regional Immigration Bureau → International Exchange Center)
- ⑤ Mailing of Certificate of Eligibility
(International Exchange Center → 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 following URL site: http://www.moj.go.jp/ONLINE/IMMIGRATION/16-1-1.html
*	(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.

For any questions about a certificate of eligibility:

Akita University International Exchange Center

1-1, Tegata Gakuen-machi

Akita-shi 010-8502 Japan

Tel.: +81-18-889-2258

E-mail: ryugaku@jimui.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 Doctor's Degree Program consists of 1 department (4 fields). The organization of this program is different from the undergraduate program and the Master's Degree Program.

[Doctor's Degree Program]

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

(2) Department Outline and Field Contents

[Department of Integrated Engineering Science]

The Department of Integrated Engineering Science consists of four fields: the Field of Life Science, the Field of Materials Science, the Field of Mathematical Science and Electrical-Electronic-Computer Engineering, and the Field of Systems Design Engineering. The aim is to develop advanced engineers, scientists capable of advanced independent research, and educators, equipped with a strong foundation in the specialized fields of life science, materials science, mathematical science and electrical-electronic-computer engineering, and systems design engineering, and with broad knowledge in other specialized areas, who will accurately recognize the needs of society and contribute to society as leaders.

《Field of Life Science》

The results of research in the life sciences, such as mapping of the human genome and discovery of iPS cells, 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. Of the various basic science fields that have been dedicated to solving the key issues believed to help us understand the secrets of life, the role played by the life science field is becoming increasingly important.

Moreover, as academic disciplines as well as science and technology continue to advance, the relationship between life science and other academic fields is becoming increasingly close, and new integrated or collaborative research fields are emerging one after another. The Field of Life Science

addresses the situation and needs of society by nurturing human resources who understand the national and regional characteristics of Japan and can see them from a global perspective, and who, while observing social obligations and the ethical code of engineers and scientists, carry out research and development based on their advanced specialized knowledge and skills in life science-related fields, while going beyond the framework of their own specialty to promote convergence with other research fields and the opening up of new research fields.

《Field of Materials Science》

While the dramatic advances in science and technology in the 20th century brought about unprecedented changes and advancement to human society, by the end of the century environmental degradation had become a serious problem on a global scale. Today in the 21st century, leading-edge technologies that enable society to achieve both abundance and environmental protection, and technologies for reducing environmental impact, are seen as more important than ever before.

To respond to these needs of society, the materials science field must be developed in order to understand the properties of materials and substances at the atomic, molecular, and electron level and, while drawing out the limits of their potential, to create new materials and functions.

To these ends, strong efforts must be made to develop human resources whose knowledge goes beyond traditional science, engineering, physics, and chemistry, and who are equipped with broad and abundant specialization in materials science transcending these existing academic areas. With the emergence of nanoscience and nanotechnology in the 1990s and after, there is a global need for materials scientists who can obtain an overview of a broad range of areas, including interdisciplinary fields, on the basis of new science and engineering foundations across traditional academic fields. The Field of Materials Science aims to nurture human resources who meet these desired characteristics, having a comprehensive understanding and awareness of the workings of nature and the properties of materials, able to convey this knowledge to society in easily understood terms, and equipped with the skills and strong ethical grounding for applying their knowledge to the sustained development of human society.

- 1) Applied Chemistry : Leading-edge education and research are carried out, aimed at gaining an understanding of the mechanisms by which material properties and functions occur on a chemistry base, including by design and analysis of materials at the atomic and molecular level, in order to develop technologies for creation and use of materials with a strong emphasis on environmental preservation and safety, and to design sustainable chemical processes. In addition, though academic projects, education and research are carried out for developing human resources with a broad perspective who will seek harmony between the earth's environment and science and technology.
- 2) Materials Science and Engineering: Education and research are carried out, aimed at developing new materials with new functions, and at improving the performance of, or

developing more efficient manufacturing processes for, already developed materials, by providing and controlling the physical, chemical, and mechanical properties of various materials, and by evaluating functions. Education and research are also carried out toward rational development and manufacturing methods and process design for realizing materials with the necessary functions.

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

The coming of the highly aging society has made it necessary to solve the problems facing local regions by creating new technologies and value and by making use of information and communication technologies (ICT).

The objective of this field is to develop human resources who have acquired interdisciplinary and advanced specialized technology. To this end, an education and research program is provided that starts from the fundamental science fields of mathematics and physics and encompasses leading-edge technology fields of electrical and electronic engineering as well as computer engineering.

- 1) **Mathematical Science:** Abstract thinking skills and intuitive ability in mathematics or physics are said to be qualities characteristic of persons who study in the field of mathematical science such as mathematics, theoretical physics, and computer science. In today's society, as the amount of information conveyed grows enormously day by day and its contents are becoming increasingly complex, such qualities are likely to be in high demand in many different areas. Students in Mathematical Science are assumed to have completed the contents of the master's program in the Mathematical Science Course or the equivalent. Building on this knowledge, they pursue advanced studies in methods of creating mathematical structures and physical models and in techniques of analysis and computation that are essential to building fundamental theories in the science and engineering fields, as well as forming a broad perspective through studies in related fields, as they carry out education and research aimed at heightening their problem-solving skills from a mathematical science perspective.
- 2) **Electrical and Electronic Engineering:** Today's information society is supported by infrastructure that includes electrical energy, electronic equipment incorporating photonic and electronic devices such as liquid crystal displays and microchips, information networks of optical fiber and mobile phones, and the control systems necessary for large-scale systems of various kinds as well as robots. Education and research are carried out for developing human resources able to deeply absorb the essence of leading-edge technologies in the specialized fields relating to electrical and electronic engineering, and who will contribute to solving global problems of which energy and environmental issues are representative, as well as regional issues such as aging populations and community revitalization.

- 3) **Human-Centered Computing:** Necessary for using ICT to achieve harmony between people and computers are (i) a deep understanding of the way human beings process information and development of technology making use of that understanding, (ii) development of advanced sensing technology to enable acquisition of the desired information, and (iii) development of technologies and application systems for realizing safe and secure networks that convey information properly. Education and research in Human-Centered Computing include such subjects as advanced study on sensory information engineering, which deals with psychophysics methods for investigating perception and motor functions including brain functions of living beings as well as the design of testing and support systems; advanced study on remote sensing engineering for analyzing remote sensing data, developing algorithms, and applying image recognition; and advanced study on information network theory for developing information network routing rules, network design, and optimization methods.

《Field of Systems Design Engineering》

The outstanding capabilities of the Japanese in the art of manufacturing and in building production infrastructure are believed to be major factors enabling rapid economic growth in a short time, which turned Japan into a highly developed country. For the near and long-term future, however, the urgent needs for realizing sustainable societal growth include dealing with such problems as the aging society with declining birthrates, and information technology revolution, obtaining energy on a global scale, and protecting the local and global environment by building the infrastructure for a material-cycle society.

The field aims to address such issues through manufacturing toward formation of a sustainable society, creation of new industries, and provision of infrastructure for everyday life. It is therefore a field of study that seeks convergence and harmony among various areas including mechanical engineering, space engineering, electrical and electronic engineering, and civil and environmental engineering; and for the sake of building a society that enjoys sustainable and creative growth without harming the global environment, it aims to contribute to solving regional problems and extend these solutions worldwide. To achieve these objectives, the field consists of three areas of study. The first is Mechanical Engineering, focusing on sustainable manufacturing based primarily on: microtechnology and nanotechnology; technologies for an aging society that are developed through interdisciplinary collaboration between medicine, science, and engineering; and high-efficiency thermofluid technology. Second is Creative Engineering, where the focus is on creation of new industries and the high-level processing and control technologies to support them, in such relatively new technology areas as aerospace engineering. The third is Civil and Environmental Engineering, aimed at building and maintaining social infrastructure in urban and regional areas in an aging society with declining birthrates, designed for disaster prevention and mitigation and for environmental protection, where

anyone can live and produce.

- 1) **Mechanical Engineering:** With a view to helping create a sustainable society where people, the environment, and machines are in harmony, education and research are carried out in three areas: human mechatronics for supporting more convenient and affluent lifestyles and contributing to improvement of healthcare and welfare technology in an aging society with declining birthrate; thermofluid science for ensuring a sustainable environment and obtaining stable supplies of renewable energy; and nanomechanics for helping to make smaller, more advanced machines.
- 2) **Creative Engineering:** Education and research are carried out toward active engagement in creation of new industries by developing the aerospace field and other relatively new engineering fields and enabling creative manufacturing in various areas. The studies therefore include dynamic analysis of biomechanical systems, heat transfer enhancement mechanisms with flow instability, development of new people-friendly, ecological engineering materials, environmentally conscious product service systems, and surface improvement of engineering materials.
- 3) **Civil and Environmental Engineering:** Education and research are aimed at building and maintaining social infrastructure that is in harmony with the environment and disaster resistant, enabling all people to live in safety and security, by conducting advanced research and technology development mainly in the areas of structural engineering, geotechnics, hydraulic engineering, urban and traffic engineering, and concrete engineering, as well as fields merging these areas.

Field	Life Science		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Life Science	Structural Biology of enzyme reaction mechanisms, biochemical characterization, and medical and/or industrial applications of protein nanocompartments	Prof. Masafumi Odaka	Bioanalytical Science I, II Spectroscopy and Analytical Chemistry I, II
	Computational design of photofunctional molecular devices.	Associate Prof. Yoshiaki Amatatsu	Computational Chemistry for Molecular Design I, II
	Development of nanotechnology oriented bioelectrochemical devices.	Associate Prof. Uichi Akiba	Biofunctional Electrochemistry I, II
	Studies on synthesis and characterization of new functional materials based on macrocyclic compounds.	Lecturer Yoshihiko Kondo	Supramolecular Chemistry for Biology I, II
	Studies on protein folding mechanism of newly synthesized polypeptide by the molecular chaperone.	Prof. Hideaki Itoh	Molecular Biological Chemistry I, II
	Study of molecular maturation and quality control of proteins in living cells. Toxicity of aggregation prone proteins in neurodegenerative disease. Toxicity of aggregation prone proteins in neurodegenerative disease.	Prof. Hiroshi Kubota	Molecular Cell Biology I, II
	Studies on the pathogenesis of kidney diseases and autoimmune diseases.	Prof. Hideki Wakui	Molecular Biology of Disease I, II
	Erythropoiesis, functional structure of membrane skeleton, and biochemical adaptation in animal evolution.	Associate Prof. Wataru Nunomura	Evolutional Biology in Medicine I, II

Field	Materials Science		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Applied Chemistry	Design and Preparation of Organic Functional Materials for Target Functions	Prof. Mitsutoshi Jikei	Organic Functional Materials I
	Development and Evaluation of Organic Functional Materials for Target Functions	Prof. Mitsutoshi Jikei	Organic Functional Materials II
	Development of Conversion Process of Carbon Resources to Energy and High Functional Materials	Prof. Kenji Murakami	Carbon Resource Processing I, II
	Application of Physical Chemistry to Resource-related issues	Associate Prof. Kiyoshi Fuda	Physical Chemistry for Resources I, II
	Design and Characterization of Inorganic Functional Materials such as Catalytic Materials and Ceramics	Associate Prof. Sumio Kato	Functional Inorganic Materials I, II
	Fundamental design and development of environmental catalysts, and their application to chemical conversion and recycling of organic resources	Prof. Takayoshi Shindo	Catalytic Process Engineering I, II
	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	Prof. Kenzo Munakata	Chemical Process Design I, II
	Design and Development of Chemical Processes	Associate Prof. Hiroshi Takahashi	Advanced Chemical Process Design I, II
	Chemical Reaction Process Design Focusing on Resources Utilization, New Energy Development and Advanced Materials Engineering	Prof. Katsuyasu Sugawara	Energy Process Engineering I, II
	Bioprocess design and development by integrating biological and biochemical technologies, and creation and application of new functional biomaterials	Prof. Takeshi Gotoh	Bioprocess Engineering
Materials Science and Engineering	Research and Education on the Structural Analysis of Materials and the Development of Structural and Functional Materials by Microstructure Control	Prof. Kaichi Saito	Diffraction Crystallography I, II
	Quantum Spectroscopy and Electronic Structure of Condensed Matter	Prof. Nobuhiro Kodama	Solid-State Spectroscopy I, II
	Structure and Magnetic Properties of Advanced Magnetic Materials and Their Evaluation Methods	Prof. Hitoshi Saito	Magnetic Materials I, II
	Fabrication and Evaluation of Thin Film Materials and Their Application to Advanced Electronic Devices	Associate Prof. Satoru Yoshimura	Advanced Magnetic Thin Films I, II
	Education and Research on the Relationship between Materials Surface Science and Chemical Surface Function as Electrocatalysis, Corrosion Resistance and Photo-excited Reactivity	Prof. Motoi Hara	Physical Chemistry of Surface I, II

Field	Materials Science		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Materials Science and Engineering	Research and Education on the Functional Materials for Fuel Cells and Electrodes of Electrolytic Processing	Prof. Masami Taguchi	Electrochemical Engineering for Electrode Reaction I, II
	Education and Research of Designing for Chemical Reaction of Non-organic Materials and Estimation of Properties	Associate Prof. Yoshiyuki Sato	Design of Reaction for High Temperature Materials I, II
	Mechanisms of Ceramic-ceramic and Ceramic-metal Reactions and their Control	Associate Prof. Akihiro Nino	Inorganic Structural Materials I, II
	Properties and Applications of Electrochemical Devices	Associate Prof. Michihisa Fukumoto	Interface Controlling Technology I, II
	Research and Education on Modeling and Simulation for Microstructure to evaluate Physical Properties of Structural Materials.	Associate Prof. Yukinobu Natsume	Physical Properties of Structural Materials I, II
	Development of Functional Materials Studied by Solidification Processing, with Topics on Manufacturing, Evaluation, and Technology Trends of Newly Developed Advanced Materials	Prof. Setsuo Aso	Solidification Process Engineering I, II
	Occurrence of High Performance in Inorganic Materials by Synergetic Structural Control via Powder Processes	Prof. Shigeo Hayashi	Advanced design of inorganic Materials I, II
	Application of Inelastic Constitutive Models to Finite Element Analysis	Prof. Ken-ichi Ohguchi	Applied Mechanics of Elasto-Plastic Materials I, II
	Manufacturing Processes and Material Evaluation of High Temperature Oxide Superconductors	Associate Prof. Xiaoye Lu	Superconducting Materials Processing Technology I, II

Field	Mathematical Science and Electrical-Electronic-Computer Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Mathematical Science	Algorithms in Algebraic Structures and Applications to Information Security and Cryptography	Prof. Akihiro Yamamura	Advanced Algebra VII, VIII
	Diffusion Equations and Stochastic Processes, and related Inverse Problems	Prof. Hajime Kawakami	Advanced Analysis VII, VIII
	Mappings in Topology of Manifolds and Applications to 2D and 3D Shape Detection	Associate Prof. Mahito Kobayashi	Advanced Geometry V, VI
	Transport Theory and its Applications in Electronic and Electromagnetic Wave Propagation	Prof. Masaru Onoda	Quantum Transport Theory I, II
	Quantum Mechanical Tunneling in Solids and Optical and Electrical Properties in Layered Materials	Associate Prof. Kunihiko Yamaguchi	Applied Condensed Matter Physics I, II
	Theory of Superconductivity Phenomenon and Anisotropic Superconductivity and its Applications	Associate Prof. Yasunari Tanuma	Advanced Physics of Superconductors I, II
Electrical and Electronic Engineering	Estimation and Design of Various Materials for Electric Energy Using Computer Simulation	Prof. Masafumi Suzuki	Computer Simulation Engineering I, II
	Recent Trends of Conversion, Storage and Delivery of Electric Energy	Associate Prof. Masashi Sato ^⑰	Electric Energy Engineering I, II
	Development and Analysis of Devices and Materials for Electric Power	Associate Prof. Seiji Kumagai	Power Device and Materials Engineering I, II
	Application, Control and Design of Power Stationary Apparatus and Rotating Machine	Prof. Katsubumi Tajima	Advanced Machinery Engineering for Electromagnetic Energy Conversion I, II
	Application of Artificial-Intelligence Type Algorithms Like Neural Networks and Genetic Algorithms for Control Systems	Associate Prof. Takeshi Miura	Intelligent Electronic Control System Engineering I, II
	Electronic Properties of Nanoscale Semiconductors and Insulator, and Their Application to Nanodevices	Prof. Seiji Horiguchi ^⑱	Nanodevice Engineering I, II
	Tera-Hertz Wave Generation and Propagation in Various Materials Including Solid-State-Plasma, and their Device Applications	Prof. Toru Kurabayashi	Terahertz Wave Technologies and Their Devices I, II
	Various Types of Compound Semiconductor Crystal Growth and Their Applications to Electronic Devices	Associate Prof. Yuichi Sato	Semiconductor Material and Device Engineering I, II
	Organic Molecular Orientation and Their Application to Optoelectronic Devices	Associate Prof. Rumiko Yamaguchi	Organic Photo-functional Material and Device I, II
	Instrumentation of Measurement and Imaging for Acoustic Wave Signal	Prof. Kazuhiko Imano	Ultrasonic Electronics I, II
	Design and Performance Analysis of LAN, WAN and MAN Networks with Respect to Lower Layers	Prof. Hitoshi Obara	Optical Network Engineering I, II
	Signal Processing for Information Communication Systems and Numerical Modeling on Signal Transmission, and These Applications	Associate Prof. Motoshi Tanaka	Advanced Signal Processing System Engineering I, II
Human-Centered Computing	Biomedical Measurements of Sensory Motor Systems and Development of Supportive Devices for Older People and Traffic Accident Prevention.	Prof. Kazutaka Mitobe	Advanced Sensory Information Engineering I, II
	Analysis and Algorithms of Remote Sensing Data, Image Recognition and Image Information Applications	Prof. Yoichi Kageyama	Advanced Remote Sensing Engineering I, II
	Study on Path Calculation and Routing, Network Design and Its Optimization for Information Networks	Associate Prof. Masashi Hashimoto	Advanced Information and Communication Network Engineering I, II

^⑰ This associate professor will retire by the mandatory retirement regulation in March 2017.

^⑱ This professor will retire by the mandatory retirement regulation in March 2018.

Field	Systems Design Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Mechanical Engineering	Analysis of Mechanical Behavior of Advanced Composites and Material Systems based on Physical Modelling	Prof. Yotsugi Shibuya	Mechanics of Materials for Systems
	Scanning Probe Microscopy for Characterization of Micro/Nano Materials	Prof. Mikio Muraoka	Advanced Engineering of Micro/Nano Materials
	Design of the Measurement System at the Micrometer to Nanometer Domain	Prof. Eiki Okuyama	Ultraprecision Measurement System
	Experimental Investigations of Nanostructured Magnetic Materials	Associate Prof. Yoshiyuki Yamamoto	Nano Magnetic Materials and Devices
	Advanced Industrial Technology and Science for Material Production, Processing and Utilization	Associate Prof. Yasuyuki Miyano	Advanced Functional Materials Science
	Raman Spectroscopic Characterization and Fabrication of Subsurface Structure	Associate Prof. Makoto Yamaguchi	Characterization of Subsurface Structure
	Friction and Wear Theory of Contact Surfaces	Associate Prof. Takayuki Tokoroyama	Advanced Tribology
	Numeical Analysis and Model Study on Biomedical Fluid System	Prof. Masahide Nakamura	Biomedical Fluid Engineering
	Convection Heat and Mass Transfer in Fluid Saturated Porous Media Encountered in Developing Geothermal Resources	Prof. Makoto Tago	Thermal Energy Conversion Engineering
	Fluid Phenomena in Unsteady Flow and Gas-Liquid Two-Phase Fluid Motion	Associate Prof. Hiroaki Hasegawa	Advanced Applied Fluid Mechanics
	Basic Theoretical Instruction and Investigation for Heat and Mass Transfer Associated with Phase Change used for Low Temperature Thermal Energy Storage Systems	Associate Prof. Yoshimi Komatsu	Low Temperature Thermal Energy Storage Engineering
	Design Method and its Application of the Advanced Control System and the Adaptive Control System	Prof. Akihiro Naganawa	Advanced Control of Mechanical Systems
	The Education and Research on the Elucidation of a Physical Movement Mechanism and the Application to its Medical treatment and Welfare Field	Associate Prof. Takehiro Iwami	Biomedical Engineering
Creative Engineering	Evaluation Method and Improvement of Joining Strength on New Engineering Materials	Prof. Osamu Kamiya	Joining of Engineering Materials
	Machining Technology for Improvement of Engineering Materials Surface and Evaluation of Mechanical Properties of Improved Surface	Associate Prof. Mamoru Takahashi	Advanced Surface Processing Engineering
	Ecodesign and Eco-efficiency Analysys of Manufacturing Processes, Products, Product-Service Systems, Businesses, and Social Systems.	Prof. Nozomu Mishima	Special Theory on Systems Ecodesign
	Heat transfer enhancement caused by flow instability and its application.	Prof. Takahiro Adachi	Heat Transfer Enhancement
	Dynamic Analysis and Control of a Bio-mechanical System related to Welfare Equipment and Sports Control Methods of Actuators for Assisting Handicapped and Senior Persons	Prof. Hitoshi Doki ⑰	Bioengineering for Sports

Field	Systems Design Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Civil and Environmental Engineering	Mechanics and Numerical Analysis of Composite Structures	Prof. Humihiko Gotou	Numerical Analysis
	Comprehension of Natural Environment and Mitigation of Disasters in Rivers and Coasts	Prof. Hideo Matsutomi	Advanced Environmental Hydraulics
	Settlement and Failure of Soft Soil Ground	Associate Prof. Toshihiro Ogino	Systematical Geotechnical Engineering
	Design of an Urban and Regional Transportation System	Prof. Hidekatsu Hamaoka	Regional Transport Engineering
	Design of an Urban Transportation System and a Welfare City	Associate Prof. Satoru Hino	Regional and Infrastructure Planning
	Construction Materials Including Concrete Polymer Composites, and Advanced Materials	Prof. Hidenobu Tokushige	Advanced Construction Materials
	Properties of Materials used for Constructing Structures and Various Construction Methods	Prof. Hidenobu Tokushige	Advanced Construction Materials

⑰ This professor will retire by the mandatory retirement regulation in March 2017.

(3) Requirements for Completion of the Doctoral Course

A Doctoral degree is awarded if the student has satisfied the following requirements: at least three years of registration in the Doctoral program; acquisition of a minimum of 12 course credits required by the Graduate School (shown in the chart below); an acceptable Doctoral thesis written under the guidance of faculty members; passing the final comprehensive evaluation.

A minimum period of 3 years, that may include the residence period in the Master's program, may be considered sufficient to receive the degree if the student demonstrates exceptional achievement.

[Credits Needed for the Completion of the Doctoral Program]

(Except students in the Field of Life Science)

Courses	Credits Required	Remarks
Common Subjects	7 credits (required)	Interdisciplinary seminars must be taken in Fields other than that of the student.
Common Subjects and Specialized Subjects	A minimum of 5 credits (elective)	
Total	A minimum of 12 credits	

[Credits Needed for the Completion of the Doctoral Program]

(For students in the Field of Life Science)

Courses	Credits Required	Remarks
Common Subjects	7 credits (required)	Interdisciplinary seminars must be taken in Fields other than that of the student.
Specialized Subjects	2 credits (required)	
Common Subjects and Specialized Subjects	A minimum of 3 credits (elective)	
Total	A minimum of 12 credits	

Doctoral Course
2016 April (Spring) Admission
Affiliated School Recommendation
Graduate School of Engineering Science, Akita University
Application for Admission

Application No.	※		
Desired Field			
Desired Supervisor			
Name of Applicant		Sex	Male / Female
Date of Birth	_____		
	month day year		
Educational History	<u>Undergraduate Level</u>		
	Name of School: Major: Date of Graduation:		
	<u>Postgraduate Level</u>		
	Name of School: Course/Major: Date of Completion:		
Current Employment	Name of Employer Address: Tel.: _____ postal code country		
Current Address	Address: Tel.: _____ postal code country Mail address:		
Contact Address	Address: Tel.: _____ postal code country		

Note:

1. ※ Official use only.
2. Please use BLOCK LETTERS and BLACK INK
3. Contact Address is where applicant wishes to receive correspondence.
4. Detailed information is requested in the Curriculum Vitae.

Curriculum Vitae

Education List all educational institutions starting with elementary school.	From:	To:	
	From:	To:	
	From:	To:	
	From:	To:	
	From:	To:	
	From:	To:	
	From:	To:	
	From:	To:	
	From:	To:	
	From:	To:	
Employment	From:	To:	
	From:	To:	
	From:	To:	
	From:	To:	
	From:	To:	
	From:	To:	
	From:	To:	
	From:	To:	
	From:	To:	
	From:	To:	
Qualifications and Licenses	Date:		
	Date:		
	Date:		
Achievements	Date:		
	Date:		

Doctoral Course
2016 April (Spring) Admission
Affiliated School Recommendation
Graduate School of Engineering Science
Akita University

ID Photo Card

Classification	Recommendation by Affiliated School
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.

Abstract of Master's Thesis (No. 1)

Graduate School of Engineering Science, Akita University

Application No.	※
Applicant's Name	
Graduate School Attended	
Desired Field	
Desired Supervisor	
Master's Thesis Title	

※ Official Use Only

Abstract of Master's Thesis (No. 2)

Graduate School of Engineering Science, Akita University

Application No.	※
Applicant's Name	
Desired Field	
Desired Supervisor	

※ Official Use Only

Research Plan

Graduate School of Engineering Science, Akita University

Application No.	※
Applicant's Name	
Desired Field	
Desired Supervisor	

※ Official Use Only

Record of Academic Achievements (No. 2)

Graduate School of Engineering Science, Akita University

Application No.	※			
Applicant's Name				
Desired Field				
Desired Supervisor				
Titles of papers, presentations, reports, patents, etc.	Year, volume, page, etc.	Name of publisher, journal, academic society, etc.	Other (Co-author or co-presenter)	

Note: 1. ※ Office use only.
 2. Enter the information in chronological order.
 3. Copies of academic papers are required.

Doctoral Course
2016 April (Spring) Admission
Graduate School of Engineering Science, Akita University
Academic Record for Approval of Application Qualification

Application Number	※
Applicant's Name	
Date of Birth (age)	
Current Employment	
Desired Field	
Desired Supervisor	
Academic History	
Employment History	
Community and/or Academic Society Activities	

Note: 1. ※ Official use only.
2. Please attach Record of Academic Achievements.

Proof of Evaluation Fee Payment Form

Application Number: ✖

Applicant's Name:

Desired Graduate School:

Desired Field:

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.