

Doctoral Courses
2015 April (Spring) Admission
Affiliated School Recommendation

Application Guidelines

Application Period:
October 23, 2014 — October 31, 2014

Akita University
Graduate School of Engineering and Resource Science

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

Overseas Affiliated Universities

Akita University is actively working with international exchange activities.

Inter-University Agreements 51 Universities (27 Countries and Regions) As of March 21, 2014

Countries, Regions	Universities	Date of Conclusion
India	Indian Institute of Technology Madras	Mar 21, 2014
Indonesia	Faculty of Earth Sciences and Technology, Instisut Teknologi Bandung	Jul 12, 2012
Korea	Hanbat National University	Jun 8, 2001
	Wonkwang University	Oct 12, 2007
	Kangwon National University	Mar 24, 2008
	Pohang University of Science and Technology	Oct 22, 2009
Thailand	Faculty of Science, Chulalongkorn University	Nov 28, 2012
Taiwan	Lunghwa University of Science and Technology	Jul 15, 2005
	National Taipei University of Technology	Jul 18, 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
	Philippines	University of the Philippines Diliman
University of the Philippines Manila		Feb 4, 2013
Bhutan	Royal University of Bhutan	Jul 6, 2012
Vietnam	Hanoi University of Technology	Dec 2, 2008
	University of Transport and Communications	Dec 3, 2008
Malaysia	University of Malaya	Nov 20, 2013
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
	Mongolia 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
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	Universidade de Santiago de Chile	Nov 21, 2013
Italy	University of Cagliari	Dec 9, 2009
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 Universitat Bergakademie Freiberg	Jul 4, 2012
Finland	Kemi-Tornio 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 15 Faculties (8 Counties and Regions) As of Nov 27, 2012

Faculties	Countries, Rejjons	Faculties, Universities	Date of Conclusion
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
Graduate School of Engineering and Resource 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, Tongii University	Sep 2, 2011

Doctoral Courses
2015 April (Spring) Admission
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Akita University

Application Guidelines

The Doctoral Courses are offered by Akita University Graduate School of Engineering and Resource 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 Resource Science or Engineering.

1. Number to be Admitted

Major	Fall	Spring
Geosciences, Geotechnology, and Materials Engineering for Resources	a few	a few
Division of Life Science	a few	a few
Advanced Materials Engineering	a few	a few
Production and Civil Engineering	a few	a few
Electrical, Electronic and Computer Systems 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, 2015.
 - (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, 2015, 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 29, 2014, and no later than October 3, 2014 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 20, 2014.

3. Application Period and Mailing Address

(1) Application Period:

From October 23, 2014 to no later than October 31, 2014.

- 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 and Resource 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 31, 2014. Special attention should be paid in estimating the days needed for overseas delivery.

(2) Mailing address:

Admissions Office
Graduate School of Engineering and Resource Science
Akita University
1-1, Tegata Gakuen-machi
Akita-shi 010-8502 Japan
Tel: +81-18-889-2313
Fax: +81-18-889-2300
E-mail: kn08@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 9, 2014 - October 31, 2014
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 Admission 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 Admission office.
Admission 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 Admission Office must be promptly notified of such change.
E-mail: kn08@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 3, 2014. 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 3, 2014 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 17, 2014.

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 Admission Office no later than December 11, 2014. 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 fees 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 fees 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, 2015 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
Graduate School of Engineering and Resource Science
Akita University
1-1, Tegata Gakuen-machi
Akita-shi 010-8502 Japan
Tel.: +81-18-889-2313 Fax: +81-18-889-2300
E-mail: kn08@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 → Graduate School of Engineering and Resource Science)
- 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/16-1-18.xls
*	(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.
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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@jimu.akita-u.ac.jp

Graduate School Outline

(1) Organization

The Graduate School of Engineering and 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 five departments (11 divisions). The organization of this program is different from the undergraduate program and the Master's Degree Program.

[Doctor's Degree Program]

Department (Major)	Division
Geosciences, Geotechnology, and Materials Engineering for Resources	Earth Sciences
	Technology for Resources and Environment
	Environmental and Resource Recycle Technology
Department of Life Science	Division of Life Science
Advanced Materials Engineering	Advanced Materials Engineering
	Environmental Chemistry and Chemical Engineering
Production and Civil Engineering	Production System Engineering
	Civil Engineering
	Welfare System Engineering
Electrical, Electronic and Computer Systems Engineering	Electrical and Computer Systems Engineering
	Electronic and Computer Systems Engineering

[Master's Degree Program]

Department (Major)	Division
Earth Science and Technology	Applied Earth Sciences
	Geo-Engineering
Applied Chemistry	Molecular Chemistry
	Chemical Engineering
Life Science	Life Science
Materials Science and Engineering	Materials Science
	Functional Materials
	Advanced Materials for Energy
	Materials Processing
Computer Science and Engineering	Information Technology
	Mathematical Science
Mechanical Engineering	Mechanical Engineering Science
	Mechanical Dynamics
	Systems Design
	Robotics and Welfare Engineering
Electrical and Electronic Engineering	Electric Energy Engineering
	Photonic and Electronic Device Engineering
	Intelligent Information Communication Engineering
	Control System Engineering
Civil and Environmental Engineering	Welfare Environment Engineering
	Structures and Materials Engineering
	Regional Environment Engineering

(2) Department Outline and Division Contents

[Department of Geosciences, Geotechnology, and Materials Engineering for Resources]

The demand for resources in the world is predicted to increase in the future, in spite of the effort to control the consumption of natural resources. The greatest task facing humans in the 21st century will be to find means to deal with the increasing demand for resources, and at the same time, to find a solution to the earth's environmental problems caused by this huge consumption. In relation to these problems, recycling of resource materials is of importance to both the saving on the earth's resources and the conservation of the earth's environment.

This department is composed of research fields concerning exploration and development of the earth's resources, preservation of the environment, and recycling of profitable resource materials.

These research fields are directly related to the problems of harmonization of human activity and nature. A further distinctive feature of the department is that it considers the development of resources and the resulting environmental problems in an integrated global approach. This department aims to produce talented researchers and engineers who possess a kind of broad knowledge and high speciality who will be in demand in future society. To achieve this end, the department has three divisions of 1) Earth Sciences, 2) Technology for Resources and Environment, and 3) Environmental and Resource Recycle Technology. Each division has individual teaching and research programs, though cooperating programs are also available between the divisions.

〈Division of Earth Sciences〉

The research of this division focuses on the genesis, exploration and evaluation of energy and mineral resources, and igneous petrology with close relations to these natural resources. The energy resources include petroleum, coal, natural gas, and geothermal energy. The mineral resources cover metal and non-metal ores including deep-sea manganese nodules and active sea-floor hydrothermal deposits. As a basis for study on these natural resources, emphasis is placed on such fundamental earth sciences as petrology, mineralogy, stratigraphy, paleontology, historical geology, volcanology, structural geology, marine geology, solid earth geophysics, and geochemistry. In addition to these studies, prevention of disasters caused by volcanic eruptions, earthquakes, and landslides, as well as environmental geology and urban geology are studied. This division consists of three fields of instruction and research: 1) Resource Geology, 2) Igneous Petrology, and 3) Geothermal Energy and Geophysics.

〈Division of Technology for Resources and Environment〉

The principal research subjects in this division are technologies for resource development and the assessment of that development's influence on the earth's environment. To meet this purpose, the division is organized into two fields of instruction and research: 1) Resource Development with Environment Sustenance and 2) Crust-Marine Engineering.

The research fields in Resource Development with Environment Sustenance cover the development of such energy resources as oil, coal, natural gas and geothermal energy, ore excavation, water resources including geochemical cycles, and Cenozoic volcanic activity. The Crust-Marine Engineering section includes transport technology for resource materials, multiphase flow technology, rock mechanics, utilization of underground spaces, and technology for the development of submarine resources.

〈Division of Environmental and Resource Recycle Technology〉

The principal educational and research subjects in this division are environmental technologies related to mineral and material processing, environmental technology including recycling, synthesis

of new substances based on molecular design, waste water treatment, and air pollution control. A systematic and global education is conducted on the following three topics:

- (1) Mineral processing, ferrous, nonferrous, precious and rare metals metallurgy and recycling processes including minerals and municipal solid wastes, waste water treatment and soil remediation for environmental protection.
- (2) Process design related to chemical engineering and the development and analysis of adsorbents, catalysts and new materials that are important for environmental control.
- (3) Synthesis of new materials and material chemistry related to materials engineering for resources and environments.

Division	Earth Sciences		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Resource Geology	Genesis of ore deposits and their time-spatial variations based on analyses of kinetic processes such as atom diffusion within minerals, crystal growth of sulfide minerals, and ore textures.		Genesis of Mineral Resources
	Genesis of mineral deposits based on the chemistry of ore-forming fluid, especially by fluid properties and stable isotope characteristics	Prof. Daizo Ishiyama	Advanced Geochemistry of Hydrothermal Solution
	Metallogeny with Special Reference to the evolution of the Earth.	Prof. Akira Imai	Advanced Geology of Ore Deposits
	Stratigraphy, micro paleontology, and paleo-environments as a basis for the genesis and exploration of energy resources such as petroleum, coal and natural gas.	Prof. Tokiyuki Sato	Theory of Stratigraphic Classification
	Calcareous nannofossil biostratigraphy, sedimentology, and historical geology as a basis for the exploration of petroleum and natural gas.	Associate Prof. Makoto Yamasaki	Theory of Applied Micropaleontology
	Modes of sediment transportation, formations of sedimentary layers and sedimentary petrology.	Prof. Takashi Uchida ⑰	Sedimentology
	Quaternary stratigraphy, sedimentology, geomorphology and tephrochronology as a basis for the history of Quaternary environmental changes.		Advanced Quaternary Geology
	Geochemistry associated with mobility of useful and toxic elements: implications for resource geology and environment.	Associate Prof. Yasumasa Ogawa	Geochemistry of resource geology and environment
Igneous Petrology	Petrology with special emphasis on the time-space characteristics of igneous rocks in relation to crustal evolution and tectonic developments.		Petrology of Volcanic Rocks
	Petrology and Sr-isotope geochemistry of volcanic rocks and mantle xenoliths, with special reference to Quaternary volcanism in the northeast Honshu arc, Japan.	Prof. Tsukasa Ohba	Chemistry Magma
	High temperature physical chemistry of element partitioning and accumulation in the Earth's interior.	Associate Prof. Toru Sugawara	Advanced Earth Material Science
			Advanced Volcanic Geology
	Geochemical and isotope characteristics of magmatic materials and circulation of elements in the earth's interior.	Associate Prof. Masatsugu Yamamoto ⑰	Geotectonics
Geothermal Energy and Geophysics	Research on subsurface velocity structures of active volcanoes and sedimentary basins by means of active and passive seismological methods.	Prof. Tadashi Nishitani ⑯	Advances in Applied Geophysics I
	Geological and geochemical applications for geothermal resource exploration the interpretation of thier, with special reference to alteration mineralogy, age determination and remote sensing.	Associate Prof. Tomoki Tsutsui	Advances in Applied Geophysics II
	Studies on the interior and outer layer of the earth and their history based on such geophysical methods as paleomagnetism, rock magnetism, and measurements and analysis of earth's magnetic and electric fields.		Advanced Geothermal Geology

⑯ This professor will retire by the mandatory retirement regulation in March 2016.

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

Division	Technology for Resources and Environment		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Resource Development with Environment Sustenance	Studies on system engineering for resource production and the underground environment.		Advanced Engineering for Resources Production and Underground Environment
	Theoretical and applied studies on the development of fluid energy resources, such as petroleum, natural gas and geothermal energy.	Prof. Hikari Fujii	Advanced Petroleum and Geothermal Engineering
	Sustainable resource exploitation and its influence upon the environment in relation to natural material circulation.		Resources and Environment
	Cenozoic volcanic stratigraphy and geology of formations consisting mainly of volcanic products, especially in the region of back arc volcanism in the northeast Honshu arc, Japan.		Advanced Volcanic Stratigraphy
Crust-Marine Engineering	Analysis and design of economical, safe, and non-contaminate transportation systems of mineral resources.		System Engineering of Hydraulic Transport
	Mechanical properties of rocks and rock masses, and their evaluation.	Prof. Fumio Sugimoto ⑮	Advanced Rock Mechanics
	Mechanical design and control for the development of submarine mineral and energy resources.		Engineering for Submarine Resources Production Systems
	Studies on rock mechanics and tectonics for geological disasters	Associate Prof. Tadao Imai	Advanced Mechanics for Geological Disasters
	Operation technology of suspension and multiphase flow in production and processing.		Multiphase Flow Technology

⑮ This professor will retire by the mandatory retirement regulation in March 2015.

Division	Environmental and Resource Recycle Technology		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Materials Processing and Recycling Engineering	Development of metallurgical processing and metal recycling for environments.	Prof. Takaho Otomo ⑮	Applied Technology of Process Metallurgy
	Development of mineral processing, resource recovery, waste water treatment and soil remediation.	Prof. Atsushi Shibayama	Advanced Mineral Processing
Resource Processing Technology	Process design for the highly efficient resource cycles based on chemical engineering, reaction engineering, and system engineering.		Chemical Process Engineering
	Bioprocess design and optimization for the production and transformation of biological compounds and resources, using enzymes, microorganisms, and plant and animal cells.	Prof. Takeshi Gotoh	Bioprocess Engineering
	Fundamental design and development of environmental catalysts, and their application to chemical conversion and recycling of organic resources.	Prof. Takayoshi Shindo	Engineering of Catalytic Processes
	Development and applications of designing for heterogeneous separation systems	Associate Prof. Hiroshi Takahashi	Advanced Chemical Process Design
Material Engineering for Resources	Fundamentals and applications of interfacial phenomena to sustainable resource and chemical processing.		Applied Interfacial Technology
	Properties and processing of resource materials from the viewpoint of utilization and functional inorganic materials.		Applied Material Chemistry
	Physical chemistry (Equilibrium, structure and change) for energy- or environment-related materials systems	Associate Prof. Kiyoshi Fuda	Applied Chemistry for Resources

⑮ This professor will retire by the mandatory retirement regulation in March 2015.

[Department to Life Science]

The Department of Life Science offers a variety of advanced education and study of basic biological and chemical sciences including cell biology, molecular biology, biochemistry organic chemistry and analytical chemistry.

The department also offers education and advanced study of applied biology of diseases and applied chemistry of biological materials.

By encouraging positive attitude to accomplish important discovery in life sciences and development of novel techniques, the department raises leaders in the life science field, including scientists, academics, engineers and other scientific specialists.

〈Division of Life Science〉

The Department Life Science includes only one division:the Division of Life Science. The Division of Life Science. The Division of Life Science consists of two scientific fields:biology and chemistry fields.

In the biology field, programs of education and study for biochemical analysis of proteins, molecular imaging in living cells, molecular biology of disease, and environmental response of proteins are included.

In the chemistry field, programs of education and study for analytical chemistry of biological and environmental materials, development of spectroscopic techniques to analyze biological interactions, development of chemically modified useful surfaces, development of useful cyclic organic compounds, and theoretical calculation of molecular structures and interactions are included.

Division	Department of Life Science		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Division of Life Science	Functional Analysis of DNA, RNA, and Proteins in Cells Against Environmental Materials Including Drugs	Prof. Hideaki Itoh	Molecular Biological Chemistry
	Normal Human Structure/Function and Diseases Caused by its Abnormality	Prof. Hideki Wakui	Molecular Biology of Disease
	Cell biology of protein quality control and molecular basis of neurodegenerative diseases	Prof. Hiroshi Kubota	Molecular Cell Biology
	Evolutional biological studies of proteins using biochemical methods	Associate Prof. Wataru Nunomura	Evolutional Biology in Medicine
	Analytical and Environmental Chemistry for Acid Rain and Fog, and for the Reaction Mechanism at the Liquid Interface and/or at the Electrode	Prof. Nobuaki Ogawa ^⑩	Analytical Solution Chemistry
	Education/study about a molecule by a highly precise theory calculation and predictions about properties aggregate and control	Associate Prof. Yoshiaki Amatatsu	Computational Chemistry for Molecular Design
	Education/study about development of a new molecule function interface based on the chemical ornamentation surface	Associate Prof. Uichi Akiba	Molecule Device Chemistry
	Development of spectroscopic methods to analyze molecular interaction in cells	Associate Prof. Kazuhiko Fujiwara	Spectroscopic analytical Chemistry
	Structural and functional analysis of organic substances including circular macromolecules	Lecturer Yoshihiko Kondo	Supramolecular Chemistry

^⑩ This professor will retire by the mandatory retirement regulation in March 2016.

[Department of Advanced Materials Engineering]

Substances or materials play an essential part in modern technology. The progress of science and technology heavily depends on the wide variety of the functions of materials and the proper choices when processing to fabricate new substances. The ability to integrate various strands of knowledge with keen creativity is vital for the future development of materials engineering. Fundamental knowledge also remains important in each specific area of metallic engineering, industrial inorganic chemistry, synthetic organic chemistry, and chemical engineering. It is necessary to understand and control the macroscopic properties and functions of a material from a microscopic interpretation based on such elementary constituents as molecules, atoms, ions, and electrons, with their bonds and associated structures.

Presently the department offers two divisions: Advanced Materials Engineering, and Environmental Chemistry and Chemical Engineering. The course encourages students to study integrated concepts from the fundamentals to the applications that involve advanced materials engineering: namely, physical properties and chemical activities, production processes, and analysis / synthesis of new functional materials. The final goal is to educate students to do their best in becoming researchers and engineers responsible for the future materials-engineering world.

〈Division of Advanced Materials Engineering〉

All materials have their own characteristic properties. For the development of new advanced functional materials, an important issue is to understand which properties are needed for advanced materials to fulfill specific functions.

This division offers a program of education and research on controlling and evaluating physical and chemical properties of new advanced functional materials. It also deals with fabrication technology and process design for developing manufacturing processes in the production of newly advanced materials with required functions.

〈Division of Environmental Chemistry and Chemical Engineering〉

Construction of various industrial and environmental processes based on the concept of the so-called *Green Sustainable Chemistry*, where full consideration is given to the preservation of the global environment and to the safety of the social environment, is an important requirement in our age. This division focuses on chemistry and chemical engineering, and is concerned with design and specific analyses of substances on the atomic, molecular, and clustered levels.

More specifically, our aims can be described as follows.

- 1) To grasp the essential nature of the mechanism whereby physical properties and functions of substances are generated, and where environmental problems arise;
- 2) To stimulate a strong awareness of the need to preserve the global environment and to

- ensure the safety of the social environment;
- 3) To create new sophisticated materials while considering the environment and to develop high technology for their use;
 - 4) To encourage pioneering research and education in fields of engineering with the aim of creating sustainable chemical and environmental processes;
 - 5) To carry out research and education of an interdisciplinary-project type that cuts across different fields of research.

Through research and education in this division it is hoped that doctoral students will acquire a broad outlook that enables them to seek harmony between the global environment on the one hand and science and technology on the other. Another major purpose of this division is to have students acquire a well-rounded human nature that is concerned with preserving the natural environment while respecting life, while also having a cosmopolitanism that will enable them to understand cultures and languages other than their own.

Division	Advanced Materials Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Quantum Materials Engineering	Physics of Magnetic Materials and their Application for Information Storage, Sensors and Other Advanced Devices	Prof. Shunji Ishio ⑩	Physical and Application of Magnetic Materials
	Properties and their Control in Materials Composed of Nanostructure	Prof. Kaichi Saito	Nanostructure Science and Engineering
	Fine Structures, Crystal Fields and Quantum Interference in Optical Crystals	Prof. Nobuhiro Kodama	Optical Properties of Crystals
	Structure and Magnetic Properties of Advanced Magnetic Materials and their Evaluation Methods	Prof. Hitoshi Saito	Advanced Magnetic Materials
		Associate Prof. Satoru Yoshimura	Advanced Magnetic Thin Films
Chemistry of Materials	Mechanisms of Ceramic-ceramic and Ceramic-metal Reactions and their Control	Prof. Hitoshi Taimatsu ⑪	Chemical Kinetics of Ceramics
	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	Surface-physical Chemistry
	Research and Education on the Functional Materials for Batteries and Electrodes of Electrolytic Processing	Prof. Masami Taguchi	Electrode Reaction Engineering
	Education and Research of Designing for Chemical Reaction of Non-organic Materials and Estimation of Properties	Associate Prof. Yoshiyuki Sato	Material Design for High-temperature Reactions
	Properties and Applications of Electrochemical Devices	Lecturer Akihiro Nino	Electrochemistry of Materials
		Lecturer Michihisa Fukumoto	Interface Controlling Technology

⑩ This professor will retire by the mandatory retirement regulation in March 2016.

⑪ This professor will retire by the mandatory retirement regulation in March 2017.

Materials Processing and Development	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
		Prof. Ken-ichi Ohsasa ⑰	Control of Materials Structure
	Occurrence of High Performance in Inorganic Materials by Synergetic Structural Control via Powder Processes	Prof. Shigeo Hayashi	Advanced Design of Inorganic Materials
	Mechanical Properties and Producing Processes of Structural Materials Made of Metals, Ceramics or their Composites	Lecturer Yukinobu Natsume	Physical Properties of Structural Materials
	Manufacturing Processes and Material Evaluation of High-functional Materials using Plastic Working	Associate Prof. Ken-ichi Ohguchi	Advanced Science and Engineering for Metalworking
	Manufacturing Processes and Material Evaluation of High Temperature Oxide Superconductors	Associate Prof. Xiaoye Lu	Superconducting Materials Processing

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

Division	Environmental Chemistry and Chemical Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Environmental Molecular Design Chemistry	Molecular Design and Development of New Organic Synthetic Strategy Focusing on Supramolecular and Enzyme-modeling	Prof. Fumio Hamada ⑮	Synthetic Chemistry for Functional Molecules
	Reaction and Molecular Design of Reactive Polymers, Molecular Assembly, and Functional Gels for Biomimetic and Environmental Applications		Chemistry of Reactive Polymers
	Design, Preparation and Evaluation of Target Functions of Organic Macromolecules	Prof. Mitsutoshi Jikei	Organic Functional Materials
Environmental Chemical Process Engineering	Research and Education on 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	Engineering for Chemical Process Design
	Chemical Reaction Process Design Focusing on Resource Utilization, New Energy Development and Advanced Material Engineering	Prof. Katsuyasu Sugawara	Energy Process Engineering
	Development of Conversion Process of Carbon Resources to Energy and High Functional Materials	Prof. Kenji Murakami	Carbon Resource Processing
Environmental Materials Engineering	Design and Characterization of Metal Oxide Materials Based on Analysis of Crystal Structure and Preparation Process	Associate Prof. Sumio Kato	Crystal Structure Design of Inorganic Materials
	Advanced Processes of Inorganic Materials Based on Carbons, and Evaluation of Thermal, Biological and Environment Characteristics		Advanced Topics of Functional Inorganic Materials

⑮ This professor will retire by the mandatory retirement regulation in March 2015.

[Department of Production and Civil Engineering]

Production and life bases responding to information technology innovation and an aging society with fewer children have to be made secure for sustainable human development. Construction of a recycling-oriented society by long- and short-term strategies is demanded from the aspect of a stable energy supply on a global mass scale with protection of global and local environments.

For such needs, the Department of Production and Civil Engineering offers a program of education and research on mechanical engineering and civil engineering. The department is composed of three divisions. Production Engineering is related to producing value-added mechanical devices in a competitive market under sustainable human development while considering the global environment. Civil Engineering is related to the measurement and planning of the construction and maintenance of life and production bases while considering disaster-prevention and security. Welfare System Engineering is related to the development of assistive devices for aged and disabled persons, as regional environments prepare for an aging society with fewer children.

〈Division of Production System Engineering〉

This program of education and research has relevance to the development of automatic control systems involving electronic and information technologies and the flexible man-machine system. It also covers theories and their applications on high-efficiency energy conversion machinery based on thermal and fluid engineering, and the evaluation of advanced materials and the ultraprecision measurement system with an atomic level of accuracy. This division aims at training researchers and engineers with advanced technology that will contribute to the construction of a sustainable growth society.

〈Division of Civil Engineering〉

This program of education and research has relevance to structural analysis and design of public constructs that constitute a social base. It evaluates mechanical properties of structural materials such as steel, concrete, carbon fiber, polymer, and a composite structure composed of various materials. It also provides education and research on measures and planning on the construction and maintenance of life and production bases, i.e., traffic planning, regional environment planning, soil engineering, water environment conservation and disaster-prevention technology prepared for global environmental change. This division aims at training researchers and engineers contributing to construction and maintenance of an infrastructure at this time of globalism.

〈Division of Welfare System Engineering〉

In an aging society with fewer children, it is necessary to create a social environment where people can live safely and comfortably while production takes place. Research on the construction of welfare-oriented city and community, and the development of mechanical systems with a barrier-free

concept is thus required. Our program of education and research has relevance to the improvement of motor functions and the development of assistive devices for aged and disabled persons on the basis of automatic control systems and vibration control. This division aims at training researchers and engineers with hardware and software technologies that contribute to human society.

Division	Production System Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Theory of Elasticity	Strategic Method of Eco-products Design by Sophisticated Usage of Elastic Materials, and Developing Method of the Computer Code		Elastic Material Systems and Engineering Design
	Analysis of Mechanical Behavior of Advanced Composites and Material Systems based on Physical Modelling	Prof. Yotsugi Shibuya	Mechanics of Materials for Systems
	Structures of Excited States in Atomic Molecules and Nuclear Clusters Studied by the Normal Modes of Motions (Characteristic Vibrations)	Prof. Eiji Uegaki ⑮	Normal Modes of Vibrations
	Experimental Investigations of Magnetic Materials using a Pulsed Magnetic Field		Applied Magnetism
	Experimental Investigations of Nano-structured Magnetic Materials	Associate Prof. Yoshiyuki Yamamoto	Nano magnetic Materials and Devices
	Raman Spectroscopic Characterization and Fabrication of Subsurface Structure	Associate Prof. Makoto Yamaguchi	Characterization of Subsurface structure
Mechanical Strength, Measurement and Control Engineering	Evaluation Method and Improvement of Joining Strength on New Engineering Materials	Prof. Osamu Kamiya	Joining of Engineering Materials
	Design of the Measurement System at the Micrometer to Nanometer Domain	Associate Prof. Eiki Okuyama	Ultraprecision Measurement System
	Scanning Probe Microscopy for Characterization of Micro/Nano Materials	Prof. Mikio Muraoka	Advanced Engineering of Micro/Nano 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
	Integrated Optimal Design of Structural and Control Systems		Control Engineering for Production
Fluid Mechanics and Thermal Engineering	Ecodesign and Eco-efficiency Analysis of Manufacturing Processes, Products, Product-Service Systems, Businesses, and Social Systems.	Prof. Nozomu Mishima	Special Theory on Systems Ecodesign
	Basic Theoretical Instruction and Investigation for Heat and Mass Transfer Associated with Freezing/Melting of Phase Change Materials used for Low Temperature Thermal Energy Storage Systems		Low Temperature Thermal Energy Storage 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 Fluid Mechanics
	Correlation between Heat Transfer Enhancement and Transition of Fluid Flow	Associate Prof. Takahiro Adachi	Heat Transfer Enhancement

⑮ This professor will retire by the mandatory retirement regulation in March 2015.

Division	Civil Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Structural Materials Structural Analysis	Properties of Materials used for Constructing Structures and Various Construction Methods		Advanced Construction Materials I
	Construction Materials Including Concrete Polymer Composites, and Advanced Materials	Prof. Hidenobu Tokushige	Advanced Construction Materials
	Mechanics and Numerical Analysis of Composite Structures	Associate Prof. Humihiko Gotou	Numerical Analysis
Regional System Engineering	Settlement and Failure of Soft Soil Ground	Prof. Hiroshi Oikawa ⑮	Environmental Geotechnology
	Settlement and Failure of Soft Soil Ground	Associate Prof. Toshihiro Ogino	Systematical Geotechnical Engineering
	Comprehension of Natural Environment and Mitigation of Disasters in Rivers and Coasts	Prof. Hideo Matsutomi	Advanced Environmental Hydraulics
	Disaster Assessment on Regional preparedness for Tsunamis, Storm Surges and Floods		Regional and Urban Planning
	Design of an Urban Transportation System and a Welfare City	Prof. Hidekatsu Hamaoka	Regional Transport Engineering
Associate Prof. Satoru Hino		Regional and Infrastructure Planning	

⑮ This professor will retire by the mandatory retirement regulation in March 2015.

Division	Welfare System Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Human Welfare Engineering	Environmental Functions and Control Techniques of Disaster Prevention in Rivers and Coasts		Environmental Hydraulics Engineering
Control Engineering for the Human Body	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
	Design Method and its Application of the Intelligent Control System and the Digital Control System	Prof. Akihiro Naganawa	Intelligent and Digital Control 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
Biomedical Fluid Mechanics	Numerical Analysis and Model Study on Biomedical Fluid Systems	Prof. Masahide Nakamura	Biomedical Fluid Engineering
Structural Materials Engineering	Education and Study on the Theory and Experiments of Fracture Mechanisms and Mechanical Properties of Materials on the basis of Fracture Mechanics, Strength of Materials and Damage Mechanics		Fracture and Strength of Materials
	A Dynamics Characteristic of Viscoelastic Materials and Functional Materials, and Vibration Decrement Theory		Damper and Damping Design Engineering
	Analysis of Properties for Reflection, Dispersion and Pulse Propagation of the Elastic Waves for Homogeneous and Graded Inhomogeneous Materials		Structural Elastic Engineering

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

[Department of Electrical, Electronic and Computer Systems Engineering]

The advent of contemporary technology-oriented society is dependent on the academic contribution of electrical and electronic engineering, and information engineering. It is expected that more progress in information technology (IT), on the basis of electrical and electronic technology, will play an important role in the development of a highly information-oriented society in the future. Recently, these fields have confronted a sudden increase in problems, such as the development of frontier technologies involved in interdisciplinary fields, and the harmonization of the development of technology with the natural environment. These problems can not be solved by a single technology from a single field and must be transversely and systematically analyzed by multi-technologies of several fields.

This department is composed of two divisions; namely, the organic combination of electrical and electronic engineering, and information engineering. The divisions are Electrical and Computer Systems Engineering and Electronic and Computer Systems Engineering. The divisions aim at training engineers and researchers, who acquire a wide variety of knowledge and understanding of high-level technologies to cope with rapidly changing technologies. The divisions provide teaching and research routes which concentrate on new engineering dealing not only individually but also synthetically and systematically with multi-technologies of several fields, such as conversion, transport technology and control of electrical energy, environment measurement by images, high speed diagnosis of computer hardware, devices of optoelectronics, environment electromagnetic instrumentation, living body instrumentation and information processing.

〈Division of Electrical and Computer Systems Engineering〉

The technology of Electrical and Computer Systems Engineering has made great progress. This may be attributed to the rapid advancement of information processing and information electronic technologies which are supported by such IT technology as the computer. This division provides the instruction and research routes on Computer Simulation Engineering, Advanced Lecture on Geometric Phase Effects in Quantum Transport, Electric Energy Engineering, Phenomenological Advanced Physics of Superconductors, Power Device and Materials Engineering, Advanced Machinery Engineering for Electromagnetic Energy Conversion, Intelligent Electronic Control System Engineering, Image Information for Engineering, Fault Tolerant System, Creation of Digital Contents, Advanced Sensory Information Engineering, Advanced Remote Sensing Engineering and Advanced Information and Network Technologies.

〈Division of Electronic and Computer Systems Engineering〉

The analyses of the various data in the electronic and information engineering fields and the analysis by mathematical principles contribute to human society by thoroughly integrating many fields and bringing about progress and development through technology in social life. In order to

cope with highly information-oriented and rapidly progressing frontier technologies, this division offers instruction and research routes on Nanodevices Engineering, Applications of Electromagnetic-wave-devices, Semiconductor Materials and Devices Engineering, Organic Photo Functional Material and Device, Optical Network Design Engineering, Advanced Signal Processing System Engineering, Ultrasonic Electronics, Applied Stochastic Processes, Mathematical Algorithms, Stochastic Processes and Engineering and Applied Condensed Matter Physics.

Division	Electrical and Computer Systems Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Electrical Energy Systems Engineering	Estimation and Design of Various Materials for Electric Energy Using Computer Simulation	Prof. Masafumi Suzuki	Computer Simulation Engineering
	Theory for control of geometric characteristics in quantal phase factors and its applications	Prof. Masaru Onoda	Advanced Lecture on Geometric Phase Effects in Quantum Transport
	Recent Trends of Conversion, Storage and Delivery of Electric Energy	Associate Prof. Masashi Sato ⑰	Electric Energy Engineering
	Theory of superconductivity phenomenon and anisotropic superconductivity and its applications	Associate Prof. Yasunari Tanuma	Phenomenological Advanced Physics of Superconductors
	Development and Analysis of Devices and Materials for Electric Power	Associate Prof. Seiji Kumagai	Power Device and Materials Engineering
Control Systems Engineering	Application, Control and Design of Power Stationary Apparatus and Rotating Machine	Prof. Katsubumi Tajima	Advanced Machinery Engineering for Electromagnetic Energy Conversion
	Application of Artificial-Intelligence Type Algorithms Like Neural Networks and Genetic Algorithms for Control Systems	Associate Prof. Takeshi Miura	Intelligent Electronic Control System Engineering
Information Systems Engineering	Analysis and Algorithms of Remote Sensing Data and Image Information Applications	Prof. Makoto Nishida ⑰	Image Information for Engineering
	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
	Analysis and Application of Remote Sensing Data and Image Recognition	Prof. Yoichi Kageyama	Advanced Remote Sensing Engineering
	Traffic Engineering, Application Layer Flow Control, Network Topology Design	Associate Prof. Masashi Hashimoto	Advanced Information and Network Technologies

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

Division	Electronic and Computer Systems Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Creative Electronic Device System Engineering	Electronic Properties of Nanoscale Semiconductors and Insulators, and Their Application to Nanodevices	Prof. Seiji Horiguchi	Nanodevices Engineering
	Tera-Hertz Wave Generation and Propagation in Various Materials Including Solid-Atate-Plasma, and their Device Applications	Prof. Toru Kurabayashi	Applications of Electromagnetic-wave-devices
	Various Types of Compound Semiconductor Crystal Growth and Their Applications to Electronic Devices	Associate Prof. Yuichi Sato	Semiconductor Materials and Devices Engineering
	Organic Molecular Orientation and Their Application to Optoelectronic Devices	Associate Prof. Rumiko Yamaguchi	Organic Photo Functional Material and Device
Creative Applied Electronic Systems Engineering	Design and Performance Analysis of LAN, WAN and MAN Networks with Respect to Lower Layers	Prof. Hitoshi Obara	Optical Network Design Engineering
	Signal Processing for Information Communication Systems and Numerical Modeling on Signal Transmission, and These Applications	Associate Prof. Motoshi Tanaka	Advanced Signal Processing System Engineering
Intelligent Instrumentation System	Instrumentation of Measurement and Imaging for Acoustic Wave Signal	Prof. Kazuhiko Imano	Ultrasonic Electronics
	Analysis of Counting Processes and Their Application to Photon Detectors and Random Traffic	Prof. Ryuji Igarashi ⑰	Applied Stochastic Processes

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

Division	Electronic and Computer Systems Engineering		
Field of Instruction and Research	Quality	Faculty Member	Instruction Subject
Applied Mathematical Science	Algorithms in Mathematical Structures and Applications to Information Security and Computational Complexity	Prof. Akihiro Yamamura	Mathematical Algorithms
	Constructions and Properties of Fundamental Solutions of Diffusion Equations on a Domain in a Manifold, and the Relation between Diffusion Equations and Stochastic Processes	Prof. Hajime Kawakami	Stochastic Processes and Engineering
	Quantum Mechanical Tunneling in Solids and Optical and Electrical Properties in Layered Materials	Associate Prof. Kunihiko Yamaguchi	Applied Condensed Matter Physics
	Mathematical Aspects of Shape Analysis and Geometry/Topology of Mappings	Associate Prof. Mahito Kobayashi	Shape Analysis and Topology of Mappings

(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]

Courses	Credits Required	Remarks
Courses A	A minimum of 4 credits (elective)	Earn a minimum of 4 credits from the courses offered by the Division, where the head supervisor is a member. ≪ Gain knowledge, develop ability, and cultivate basic skills needed for research projects. ≫
Courses B	A minimum of 2 credits (elective)	Earn a minimum of 2 credits from the courses offered by the Divisions or Departments where the head supervisor is NOT a member. ≪ Gain knowledge, develop ability and cultivate basic skills needed for research projects. ≫
Intensive Training	2 credits (required)	Examination and study of the latest literature written on the research theme and related fields. Instructions are given in a seminar style by the supervisors.
Thesis Plan	※(required)	Evaluation on the "Proposal" for a doctoral thesis. ≪As a preparatory step, students are to present the structure of the paper and summaries of each section orally. Permission to write a thesis is given only to those who receive a satisfactory evaluation on the "Proposal." ≫
Education Experience	※(required)	Select one: (1) Assist undergraduate or Master's program students with lab work studies. (2) Assist undergraduate or Master's program students with speech drafts and presentation skills in preparation for academic lectures and symposiums. (3) Assist outside businesses by providing research and technical guidance to their production and development staff.
Experiments	4 credits (required)	≪Acquire cutting edge techniques used in research, develop a new field to be added to the curriculum, and cultivate an ever-challenging attitude. ≫
Total	A minimum of 12 credits	

Note: ※Required but no credits can be earned.

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
2015 April (Spring) Admission
Affiliated School Recommendation
Graduate School of Engineering and Resource Science
Akita University

ID Photo Card

Classification	Recommendation by Affiliated School
Application No.	※
Name	
Desired Department (Major)	
<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 and Resource Science, Akita University

Application No.	※
Applicant's Name	
Graduate School Attended	
Desired Department (Major)	
Desired Division	
Desired Supervisor	
Master's Thesis Title	

※ Official Use Only

Abstract of Master's Thesis (No. 2)

Graduate School of Engineering and Resource Science, Akita University

Application No.	※
Applicant's Name	
Desired Department (Major)	
Desired Division	
Desired Supervisor	

※ Official Use Only

Research Plan

Graduate School of Engineering and Resource Science, Akita University

Application No.	※
Applicant's Name	
Desired Department (Major)	
Desired Division	
Desired Supervisor	

※ Official Use Only

Record of Academic Achievements (No. 1)

Graduate School of Engineering and Resource Science, Akita University

Application No.	※
Applicant's Name	
Desired Department (Major)	
Desired Division	
Desired Supervisor	
Titel of Master's Thesis	
Employment History	
Description of past work related to research (300 words or less)	

Note: 1. ※Official Use Only

2. Title of Master's Thesis is not required if the applicant has not written a thesis.

Record of Academic Achievements (No. 2)

Graduate School of Engineering and Resource Science, Akita University

Application No.	※		
Applicant's Name			
Desired Department (Major)			
Desired Division			
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
2015 April (Spring) Admission
Graduate School of Engineering and Resource Science, Akita University
Academic Record for Approval of Application Qualification

Application Number	※
Applicant's Name	
Date of Birth (age)	
Current Employment	
Desired Department (Major)	
Desired Division	
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 Department (Major):

Please paste
Proof of Payment for Evaluation

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

