

Doctoral Courses
2011 October (Fall) Admission
Affiliated School Recommendation

Application Guidelines

Application Period:
June 23, 2011 — June 29, 2011

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 31 Universities (14 Countries and Regions) As of July 23,2010

| Countries, Regions | Universities | Date of Conclusion |
|--------------------|--|--------------------|
| 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 |
| Australia | Griffith University | Oct 14, 1996 |
| Belarus | Belarussian State Medical University | Jul 26, 2004 |
| USA | St. Cloud State University | Jul 24, 1996 |
| 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 |
| New Zealand | Auckland University of Technology | Mar 17, 2004 |
| Taiwan | Lunghwa University of Science and Technology | Jul 15, 2005 |
| | National Taipei University of Technology | Jul 18, 2005 |
| Netherlands | University of Twente | Oct 23, 2007 |
| Vietnam | Hanoi University of Technology | Dec 2, 2008 |
| | University of Transport and Communications | Dec 3, 2008 |
| 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 |
| Finland | Kemi-Tornio University of Applied Sciences | Oct 23, 2009 |
| Botswana | Botswana International University of Science and Technology | Oct 23, 2009 |
| Italy | University of Cagliari | Dec 9, 2009 |
| Kenya | Kenyatta University | Mar 2, 2010 |

Inter-Faculty Agreements 17 Faculties (9 Countries and Regions) As of July 23,2010

| Faculties | Countries, Rejions | Faculties, Universities | Date of Conclusion |
|---|---|--|--------------------|
| Graduate School of Medicine | China | Beijing Hospital, Ministry of Health | Nov 14, 1995 |
| Graduate School of Engineering and Resource Science | USA | Montana College of Mineral Science and Technology | Jun 24, 1982 |
| | | Missouri University of Science and Technology | Dec 18, 2000 |
| | 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 |
| | Thailand | Faculty of Engineering, Chiang Mai University | Jul 12, 1999 |
| | | Faculty of Science, Chiang Mai University | Jul 12, 1999 |
| | | Faculty of Science, Chulalongkorn University | May 22, 2009 |
| | 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 |
| | Germany | Technische Universitat Bergakademie Freiberg | Feb 22, 2006 |
| Indonesia | Faculty of Earth Sciences and Technology, Instisut Teknologi Bandung | Mar 3, 2010 | |
| Taiwan | College of Engineering, Minghsin University of Science and Technology | Apr 12,2010 | |
| Venture Business Laboratory | Korea | Research Center for Advanced Magnetice Materials, Chungnam National University | Nov 29, 2005 |

Doctoral Courses
2011 October (Fall) Admission
Affiliated School Recommendation
Graduate School of Engineering and Resource Science
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 |
| 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 September, 2011.
 - (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 September 30, 2011, 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 May 30, 2011, and no later than June 3, 2011 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 June 13, 2011.

3. Application Period and Mailing Address

(1) Application Period:

From June 23, 2011 to no later than June 29, 2011.

- 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 June 29, 2011. 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: May 30, 2011 - June 29, 2011

Japan time must be observed.

5. Remittance Information:

Bank Name: Akita Bank, Ltd.

Branch: Tegata Branch

Address: 110-3, 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 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 June 3, 2011. 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 June 3, 2011 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 July 12, 2011.

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 August 12, 2011. 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 September 30, 2011 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@jim.u.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

1. * Designated forms are available.

2. Japanese or English translation is required if any documents under (5) are prepared in other language.

| | | 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. If the applicant has previously or otherwise been living in Japan, the pages showing entry and departure information must also be photocopied and submitted. |

| | |
|--|---|
| | <p>Documents proving capability to pay for tuition and living expenses while in school ≪Student financially self-supported, or supported by a person in home country≫</p> <ol style="list-style-type: none"> 1. Original copy of a <u>bank statement</u> showing the balance of the applicant's account verifying that the applicant has sufficient funds available to use while in Japan. 2. Document which backs the above (1.), such as original copy of <u>Certificate of Employment</u> indicating length of employment, or other <u>certificate verifying the applicant's income</u>. 3. If receiving a scholarship, an original copy of the <u>scholarship document</u> indicating the amount and duration. 4. When supported by someone from home country: Original <u>certificate showing relationship of the applicant to the person sending money</u>. (Chinese people must submit <u>notarized Family Registry</u> showing the current address.) <p>(4) ≪Student financially supported by a person living in Japan≫</p> <ol style="list-style-type: none"> 1. <u>Financial Support Statement</u> (*form designated) filled out by the financial supporter. The reason for the support, the amount of support, and the method of payment must be entered. 2. <u>Certificate of Resident's Tax</u> issued by the municipality showing the supporter's total income or <u>Certificate of Tax Payment 1 & 2</u> issued by a tax office. 3. One of the employment related documents below <ol style="list-style-type: none"> (1) <u>Certificate of Employment</u> (Salaried worker) (2) A copy of <u>Income Tax Return form</u> (Self-employed worker) (3) <u>Certificate of Company Registration</u> (Company owner or Company Executive) 4. Supporter's <u>Resident's Card</u> showing names of all family members. Alien supporter must submit <u>Certificate of Alien Registration</u>. |
|--|---|

For any questions about the visa, please contact:

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 four departments (10 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 |
| 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 |
| Materials-process Engineering and Applied Chemistry for Environments | Materials-process Engineering |
| | Materials Engineering for Resource and Environment |
| | Molecular Functional Chemistry |
| | Chemical Systems |
| Materials Science and Engineering | Materials Science |
| | Functional Materials |
| | Advanced Materials for Energy |
| | Materials Processing |
| Computer Science and Engineering | Computer Science for Human |
| | Applied Information Technology |
| | Mathematical Design |
| 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. | Prof. Toshio Mizuta ※※ | Genesis of Mineral Resources |
| | Genesis of mineral deposits based on the chemistry of ore-forming fluid, especially by fluid inclusion and stable isotope studies | Prof. Daizo Ishiyama | Advanced Geochemistry of Hydrothermal Solution |
| | Stratigraphy, micro palenotology, and paleo-environments as a basis for the genesis and exploration of energy resources such as petroleum, coal and natural gas. | Prof. Tokiyuki Sato | Advanced Stratigraphy |
| | Calcareous nannofossil biostratigraphy, sedimentology, and historical geology as a basis for the exploration of petroleum and natural gas. | Associate Prof. Makoto Yamasaki | Advanced Micropaleontology |
| | Modes of sediment transportation, formations of sedimentary layers and sedimentary petrology. | Prof. Takashi Uchida | Sedimentology |
| | Quaternary stratigraphy, sedimentology, geomorphology and tephrochronology as a basis for the history of Quaternary environmental changes. | | Advanced Quaternary Geology |
| Igneous Petrology | Geochemical and isotope characteristics of magmatic materials and circulation of elements in the earth's interior. | Associate Prof. Tsukasa Ohba | Geotectonics |
| | Petrology and Sr-isotope geochemistry of volcanic rocks and mantle xenoliths, with special reference to Quaternary volcanism in the northeast Honshu arc, Japan. | Associate Prof. Masatsugu Yamamoto | Geochemistry of Magma |
| | Petrology with special emphasis on the time-space characteristics of igneous rocks in relation to crustal evolution and tectonic developments. | | Petrology of Volcanic Rocks |
| Geothermal Energy and Geophysics | 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. | Prof. Tadashi Nishitani | Advanced Geothermal Geology |
| | Research on subsurface velocity structures of active volcanoes and sedimentary basins by means of active and passive seismological methods. | Associate Prof. Tomoki Tsutsui | 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. | | Advances in Applied Geophysics II |

※※ This professor will retire by the mandatory retirement regulation in March 2013.

| Division | Technology for Resources and Environment | | |
|---|---|----------------------------|---|
| Field of Instruction and Research | Quality | Faculty Member | Instruction Subject |
| Resource Development with Environment Sustainance | 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 |
| | 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. Shinji Yamaguchi | Advanced Petroleum and Geothermal Engineering |
| Crust-Marine Engineering | Analysis and design of economical, safe, and non-contaminate transportation systems of mineral resources. | Prof. Hiroshi Sato ※※※ | Engineering of Hydraulic Transport Systems |
| | Mechanical properties of rocks and rock masses, and their evaluation. | Prof. Fumio Sugimoto | 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 |

※※※ This professor will retire by the mandatory retirement regulation in March 2014.

| 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 | Applied Technology of Process Metallurgy |
| | Development of mineral processing, resource recovery, waste water treatment and soil remediation. | Prof. Atsushi Shibayama | Applied Technology of Resources Processing |
| Resource Processing Technology | Process design for the highly efficient resource cycles based on chemical engineering, reaction engineering, and system engineering. | Prof. Ken-ichi Kikuchi ※ | Chemical Process Engineering |
| | Fundamental design and development of environmental catalysts, and their application to chemical conversion and recycling of organic resources. | Associate Prof. Takayoshi Shindo | Engineering of Catalytic Processes |
| | 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 |
| | Development and applications of designing for heterogeneous separation systems | Associate Prof. Hiroshi Takahashi | Design for Separation Process |
| 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 Physical Chemistry |

※ This professor will retire by the mandatory retirement regulation in March 2012.

[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 | Physical Properties of Magnetic Materials |
| | Properties and their Control in Materials Composed of Nanostructure | Prof. Shigeo Sugawara ※ | 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 | 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 | Materials Surface 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 | Design of High-temperature Reactions |
| | Properties and Applications of Electrochemical Devices | Associate Prof. Eiji Tada | Electrochemistry of Materials |
| | | Lecturer Michihisa Fukumoto | Interface Controlling Technology |

※ This professor will retire by the mandatory retirement regulation in March 2012.

| | | | |
|--------------------------------------|---|----------------------------------|---|
| 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 | 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 | Associate Prof. Kaichi Saito | Advanced Science for 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 | Advanced Processing of Superconducting Materials |

| 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 | Advanced Molecular Synthetic Chemistry |
| | Reaction and Molecular Design of Reactive Polymers, Molecular Assembly, and Functional Gels for Biomimetic and Environmental Applications | Prof. Noritaka Ohtani ※ | Chemistry of Reactive Polymers |
| | Functional Analysis of DNA, RNA, and Proteins in Cells Against Environmental Materials Including Drugs | Prof. Hideaki Itoh | Molecular Biological Chemistry |
| | Design, Preparation and Evaluation of Target Functions of Organic Macromolecules | Prof. Mitsutoshi Jikei | Advanced Macromolecular Chemistry |
| | Educator / study about a molecule by a highly precise theory calculation and predictions about properties aggregate and control | Associate Prof. Yoshiaki Amatatsu | Calculation Molecule Design Study |
| | Education / study about development of a new molecule function interface based on the chemical ornamentation surface | Associate Prof. Uichi Akiba | Molecule Function Development Study |
| | Cell biology of protein quality control and molecular basis of neurodegenerative diseases | Prof. Hiroshi Kubota | Molecular Cell Biology |
| Environmental Chemical Process Engineering | Advanced Topics Focusing on Industrial Resources Conversion, Materials Processing and Recycling for Earth-friendly Process Design | Prof. Kenzo Munakata | Advanced Topics of Chemical Reaction Engineering |
| | Chemical Reaction Process Design Focusing on Resource Utilization, New Energy Development and Advanced Material Engineering | Prof. Katsuyasu Sugawara | Solid Reaction Process Engineering |
| | Analytical and Environmental Chemistry for Acid Rain and Fog, and for the Reaction Mechanism at the Liquid-Liquid Interface and/or at the Electrode | Prof. Nobuaki Ogawa | Environmental Solution Chemistry |
| Environmental Materials Engineering | Structural Characterization and Mechanistic Analysis of Function Expression and Application to Green Sustainable Technology on ordered Porous Materials and Solid Catalysts | Prof. Shinichi Nakata | Analysis and Engineering for Materials Function |
| | Analysis and Application of the Sintering Processes and Related Phenomena | Associate Prof. Sumio Kato | Advanced Topics of Ceramic Materials Design |
| | Advanced Processes of Inorganic Materials Based on Carbons, and Evaluation of Thermal, Biological and Environment Characteristics | | Advanced Topics of Functional Inorganic Materials |

※ This professor will retire by the mandatory retirement regulation in March 2012.

[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 | Mechanics for Vibrational Modes in Clusters |
| | Experimental Investigations of Magnetic Materials using a Pulsed Magnetic Field | Associate Prof. Takuo Sakon | Magnetic Properties of Condensed Matter Physics |
| | Experimental Investigations of Nano-structured Magnetic Materials | Associate Prof. Yoshiyuki Yamamoto | Nano magnetic Materials Engineering |
| 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 | Machine Minute Materials |
| | Integrated Optimal Design of Structural and Control Systems | | Control Engineering for Production |
| Fluid Mechanics and Thermal Engineering | 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 Applied Fluid Mechanics |
| | Correlation between Heat Transfer Enhancement and Transition of Fluid Flow | Associate Prof. Takahiro Adachi | Heat Transfer Enhancement |

| 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 | Prof. Makoto Kagaya | Advanced Construction Materials I |
| | Construction Materials Including Concrete Polymer Composites, and Advanced Materials | Associate Prof. Hidenobu Tokushige | Advanced Construction Materials II |
| | Mechanics and Numerical Analysis of Composite Structures | Prof. Kaoru Hasebe | Numerical Analysis |
| | Numerical Modeling and Analysis of Hybrid Structures | Associate Prof. Humihiko Gotou | Hybrid Structural Mechanics |
| Regional System Engineering | Settlement and Failure of Soft Soil Ground | Associate Prof. Toshihiro Ogino | Geotechnical Engineering |
| | Comprehension of Natural Environment and Mitigation of Disasters in Rivers and Coasts | Prof. Hideo Matsutomi | Environmental Hydraulics |
| | Disaster Assessment on Regional preparedness for Tsunamis, Storm Surges and Floods | Prof. Kazuhiro Kimura | Engineering of Welfare Transportation System |
| | Design of an Urban Transportation System and a Welfare City | Associate Prof. Hidekatsu Hamaoka | Regional Traffic Engineering |
| | | Associate Prof. Satoru Hino | Regional Infrastructure Planning |

| 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 | Control Engineering for Biomechanisms |
| | Design Method and its Application of the Intelligent Control System and the Digital Control System | Prof. Akihiro Naganawa | Intelligent and Digital Control Systems |
| Biomedical Fluid Mechanics | Numerical Analysis and Model Study on Biomedical Fluid Systems | Prof. Masahide Nakamura | Biomedical Fluid Mechanics |
| 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 | Prof. Manabu Tanaka ※※ | 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 | Associate Prof. Kimihisa Miura ※※※※ | Structural Elastic Engineering |

※※ This professor will retire by the mandatory retirement regulation in March 2013.

※※※※ This Associate Professor will retire by the mandatory retirement regulation in March 2013.

[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 Fundamental of Electrical Engineering, Electric Energy Engineering, Computer Simulation Engineering, Environmental Biomedical Engineering, Geometric Quantum Phases and Their Applications, Theoretical Study on Nonuniform Unconventional Superconductors, Control Engineering for the Servo System, Applied High Energy EM Interaction, Machinery Engineering for Electromagnetic Energy Conversion, Image Information for Engineering, the Fault Tolerant System, Telecommunications Network Engineering and Biological Information Processing, all of which aim at the organic combination of energy engineering considering the environment problem, application of image processing and information engineering centering on computer hardware.

〈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 Photonic and Electronic Device Engineering, Sub-Millimeter Wave and Far-Infrared Engineering, Semiconductor Materials and Devices Engineering, Electromagnetic Environment and Compatibility for Information Engineering, Computer Network Engineering, Ultrasonic Electronics, Applied Stochastic Processes, Applied Analytics, Poisson Geometry of Dynamics, Applied Condensed Matter Physics and Diffusion Equations and Stochastic Processes.

| Division | Electrical and Computer Systems Engineering | | |
|--|--|---|---|
| Field of Instruction and Research | Quality | Faculty Member | Instruction Subject |
| Electrical Energy Systems Engineering | Properties of Dielectrics and Electrical Insulating Materials for Electric Energy, Information Measurement of Dielectrics and Electrical Insulating Materials due to Image Processing Technology and Various Sensors | | Fundamental of Electrical Engineering |
| | Estimation and Design of Various Materials for Electric Energy Using Computer Simulation | Prof. Masafumi Suzuki | Computer Simulation Engineering |
| | Recent Trends of Conversion, Storage and Delivery of Electric Energy | Associate Prof. Masashi Sato | Electric Energy Engineering |
| | Biomedical Measurements of Sensory-Motor Systems and Development of Supportive Devices for Older People and Traffic Accident Prevention | Associate Prof. Kazutaka Mitobe | Environmental Biomedical Engineering |
| | | Associate Prof. Masaru Onoda | Advanced Course of Quantum Phase Control |
| | | Associate Prof. Yasunari Tanuma | Phenomenological Theory of Anisotropic Superconductors |
| Control Systems Engineering | Control Method of Servo System using Servomotor and Stepping Motor | | Control Engineering for Servo System |
| | High Energy Electro-Magnetic Phenomena of Elementary Particles and Method of Measurement | | Applied High Energy EM Interaction |
| | Application of Electromagnetic Field Analysis for Rotating Machine and Power Apparatus | | Electromagnetic Apparatus and Systems Engineering |
| | Application, Control and Design of Power Stationary Apparatus and Rotating Machine | Prof. Katsubumi Tajima | 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 | Image Information for Engineering |
| | Highly Reliable Computer System and Fault Tolerant Design | Prof. Hideo Tamamoto ※※※ | Fault Tolerant System |
| | | | Creation of Digital Contents |
| | Telecommunications Network Architecture and Application of Photonic Technologies | Prof. Ken-ichi Yukimatsu ※※ | Advanced Telecommunications Networks |
| | Analysis and Application of Remote Sensing Data and Image Recognition | Associate Prof. Yoichi Kageyama | Advanced Remote Sensing Engineering |
| Traffic Engineering, Application Layer Flow Control, Network Topology Design | Associate Prof. Masashi Hashimoto | Advanced Information Theory and Network Engineering in Industries | |

※※ This professor will retire by the mandatory retirement regulation in March 2013.

※※※ This professor will retire by the mandatory retirement regulation in March 2014.

| Division | Electronic and Computer Systems Engineering | | |
|---|--|----------------------------------|---|
| Field of Instruction and Research | Quality | Faculty Member | Instruction Subject |
| Creative Electronic Device System Engineering | Clarification and Application of Optical and Electronic Materials and Their Application to Optoelectronic Devices | | Photonic and Electronic Device Engineering |
| | Wave Propagation Characteristics in Various Materials Including Solid-State Plasma and Their Device Applications in Millimeter Wave to Far-Infrared Region | | Sub-Millimeter Wave and Far-Infrared Engineering |
| | Electronic Properties of Nanoscale Semiconductors and Insulators, and Their Application to Nanodevices | Prof. Seiji Horiguchi | Nanodevice Engineering |
| | 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 Materials and Electronic Device Engineering |
| Creative Applied Electronic Systems Engineering | Applied Measurements of Electronic Devices and Electromagnetic Wave and Applied Systems in Electromagnetic Compatibility including Bio-medical Systems | Prof. Hitoshi Inoue ※ | Electromagnetic Environment and Compatibility for Information Engineering |
| | Network Protocol, Network Management, Speech Processing and Image Processing for Information Communication Systems | | Computer Network Engineering |
| | Design and Performance Analysis of LAN, WAN and MAN Networks with Respect to Lower Layers | Prof. Hitoshi Obara | Optical Network 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 | Applied Stochastic Processes |

※ This professor will retire by the mandatory retirement regulation in March 2012.

| Division | Electronic and Computer Systems Engineering | | |
|-----------------------------------|---|------------------------------------|--|
| Field of Instruction and Research | Quality | Faculty Member | Instruction Subject |
| Applied Mathematical Science | Prediction and Database for Physical Properties of Metals and Mixed Semiconductors under Pressure and at High Temperature | | Applied Analytics |
| | Mathematical Models of Dynamism of Sending, Transmission and Receipt of Data Structures (from the Viewpoint of Poisson Geometry) | Prof. Kentaro Mikami ※※ | Poisson Geometry of Dynamics |
| | Algorithms in Mathematical Structures and Applications to Information Security and Computational Complexity | Prof. Akihiro Yamamura | Mathematical Algorithms |
| | Quantum Mechanical Tunneling in Solids and Optical and Electrical Properties in Layered Materials | Associate Prof. Kunihiko Yamaguchi | Applied Condensed Matter Physics |
| | Constructions and Properties of Fundamental Solutions of Diffusion Equations on a Domain in a Manifold, and the Relation between Diffusion Equations and Stochastic Processes | Associate Prof. Hajime Kawakami | Diffusion Equations and Stochastic Processes |

※※ This professor will retire by the mandatory retirement regulation in March 2013.

(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.

Doctoral Course
2011 October (Fall) Admission
Affiliated School Recommendation
Graduate School of Engineering and Resource Science, Akita University
Application for Admission

| | | | |
|-----------------------------------|--|------------|----------------------|
| Application No. | ※ | | |
| Desired Department (Major) | | | |
| Desired Division | | | |
| 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: | |
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| Employment | From: | To: | |
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| | From: | To: | |
| | From: | To: | |
| Qualifications and Licenses | Date: | | |
| | Date: | | |
| | Date: | | |
| Achievements | Date: | | |
| | Date: | | |

Doctoral Course
2011 October (Fall) 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
2011 October (Fall) 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.

