

PROSPECTUS  
FOR  
THE DOCTORAL COURSE

Graduate School of Engineering  
KOBE UNIVERSITY

Term 3, 2011

(Starting in April, 2011)

## **About Kobe University Graduate School of Engineering**

Kobe University Graduate School of Engineering was established in April 2007 in the wake of the reorganization of the Graduate School of Natural Science. Both the Masters and Doctoral Courses of the Graduate School of Engineering consist of the following five departments: Architecture, Civil Engineering, Electrical and Electronic Engineering, Mechanical Engineering, and Chemical Science and Engineering.

A Doctor's Degree, either a Dr. of Engineering or a PhD will be granted upon completion of the Doctoral Program of Graduate School of Engineering.

## **Admission Policy of Kobe University Graduate School of Engineering**

The Graduate School of Engineering welcome students who have qualities as indicated in the following although the policy or criteria may differ depending on the organization or research institute a student comes from, or the department or division that accepts the student.

- ( 1 ) Individuals that have deep interest in clarifying the principles behind the natural phenomena, and developing and applying science and technology, and eagerness in discovering own challenges and solving them.
- ( 2 ) Individuals that have originality and application skills.
- ( 3 ) Individuals that have logical thinking skills and persuasiveness in presenting the achievements of research.
- ( 4 ) Individuals that have morality able to understand and perceive the effects of science and technology on the society.
- ( 5 ) Individuals who have the clear vision toward the future (either to become researchers or highly specialized professionals).
- ( 6 ) Individuals that have career in the society eager to acquire higher, more cutting-edge techniques and academic achievements.

(Where to Contact Regarding the Admission of the Doctoral Course of the Graduate School of Engineering)

Kobe University Graduate School of Engineering, Student Affairs Office  
1-1, Rokkodai-cho, Nada-ku, Kobe 657-8501  
Tel : 078-803-6350  
e-mail: eng-kyomugakusei@office.kobe-u.ac.jp  
Graduate School of Engineering Website: <http://www.eng.kobe-u.ac.jp/>  
Kobe University Website: <http://www.kobe-u.ac.jp/>

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## ◎ Attached Documents (A Set of Forms Designated by the Graduate School of Engineering Required for Application)

- Application Form (Form No.1)
- Curriculum Vitae (Form No. 2)
- ID for the examination (Form No.3)
- Certificate of payment Card (Form No. 4)
- About the payment of entrance exam fee for application (Form No. 5)

- Summary of master's thesis and summary of research program (Form No. 6)
- Research proposal (Form No. 7)
- Self-addressed Forms (Form No. 8)
- Application Form for Examination of Qualification (Form No. 9)
- History of research (Form No. 10)
- Research experience (Form No. 11)

I      The Doctoral Course of Graduate School of Engineering  
          General Admission Guidelines

**2011 April (Term 3)**  
**Kobe University Graduate School of Engineering, the Doctoral Course**  
**Students Admission Guidelines**

**1. Departments and the Number to be Accepted**

Department	No. of Acceptance
Architecture	6
Civil Engineering	4
Electrical and Electronic Engineering	8
Mechanical Engineering	9
Chemical Science and Engineering	1
Total	28

(Note) The number of acceptance includes new students, foreign students, and students entering from workforce.

**2. Qualification for Applicants**

Persons who meet one of the following requirements have the eligibility.

- (1) A person who has received, or is expected to receive a master's degree or a professional degree by March 31, 2011.
- (2) A person who has received, or is expected to receive a degree equivalent to a master's degree or a professional degree in a foreign country by March 31, 2011.
- (3) A person living in Japan who has completed the correspondence course in a foreign-affiliated educational institution and received or is expected to receive a degree equivalent to a master's degree or a professional degree by March 31, 2011.
- (4) A person who has completed, or is expected to complete the education in a foreign-affiliated university within a school educational system of a foreign country in Japan and designated by the Minister of Education, Culture, Sports, Science and Technology limited to a person who has received a degree equivalent to a master's degree or a professional degree by March 31, 2011.
- (5) A person designated by the Minister of Education, Culture, Sports, Science and Technology (under Minister of Education, Culture, Sports, Science and Technology Public Notice No. 118, 1989).
- (6) A person who is 24 years of age or older, and is recognized by individual screening as having academic abilities equivalent or superior to those given a master's degree or a professional degree.

**【Note】** Those who intend to apply under the requirement (5) or (6) above should refer to “8. Eligibility Screening” because they are subject to screening prior to acceptance of their applications.

### 3. Application Procedures

- (1) Period of application and how to submit the application  
**From January 19 (Wed) 2011 to January 26 (Wed) 2011 (except Saturday, Sunday & Holidays)**  
When you submit in person, the office hour is Monday through Friday, from 9:00 to 12:00 & 13:00-17:00.  
If you submit by mail, your application documents must be sent by Thursday, November 18 (effective post mark). On the envelope, mark “Application Documents for the Doctoral Course” in red and mail it by “simplified registered mail”. Make sure to include a self-addressed envelope (23.5 cm long × 12 cm wide with a 350 yen stamp).
- (2) Where to send the application documents (by mail)  
Kobe University Graduate School of Engineering, Students Affairs Office  
1-1, Rokkodai-cho, Nada-ku, Kobe 657-8501  
Tel (078) 803-6350 (direct)
- (3) Application documents
  - (A) Application form: Form designated by the Graduate School of Engineering (Form No.1)
  - (B) ID for the examination (Form No. 3) and Certificate of payment Card (Form No. 4)
  - (C) Photograph: Affix two copies of photograph to the designated places on the application form and the exam admission card.  
The photograph should be 4 cm long and 3 cm wide and of upper body, taken within three months prior to submitting the application; in the picture, you should be looking straight ahead with your head uncovered.
  - (D) Curriculum Vitae: Form designated by the Graduate School of Engineering (Form No.2)
  - (E) Graduation certificate (including expecting) of the master’s degree program of graduate school (master course)
  - (F) Academic transcript (1): Academic performance record created by the head of faculty or the principal of the university you graduated from
  - (G) Academic transcript (2): Academic performance record created by the head of department or the principal of the graduate school you graduated from
  - (H) Entrance exam fee: ¥30,000  
Bring the attached form of JP bank (Form No. 5) and deposit the fee from the bank; make sure to affix the proof of receipt of postal transfer for entrance exam fee to the mounting card and send it together with the application documents. (A person who lives in a foreign country should purchase the international postal money order (¥30,000) and send it with the documents.) Japanese government-sponsored international students who will continue to be so after enrollment do not have to pay the fee on condition that they should submit the “Certificate of Japanese Government-sponsored International Student” from the university you are currently enrolled (unless you are a student of Kobe University).
  - (I) Master thesis:
    - (a) Applicants who have completed a master’s degree program (master course)
      - i ) A copy of Master thesis written in either Japanese or English (or a substitute of the thesis if not available.)
      - ii ) Summary of master’s thesis (A4) : A set of copies of the outline written in both Japanese (approx. 2,000 words) and English (approx. 1,200 words), with a cover sheet designated by the Graduate School of Engineering (Form No. 6). For foreign applicants, only English copy suffices.

(b) Applicants expected to complete a master's degree program (master course) or applied for eligibility screening

Summary of research program (A4) : A set of copies of the report written in both Japanese (approx. 2,000 words) and English (approx. 1,200 words), with a cover sheet designated by the Graduate School of Engineering (Form No. 6). For foreign applicants, only English copy suffices.

(c) Any reference material other than indicated above may be submitted.

(J) Research proposal : A copy of A4 report written in Japanese (approx. 2,000 words) or English (approx. 1,200 words) with a cover sheet designated by the Graduate School of Engineering (Form No. 7) indicating the details of your intended research and field.

(K) Official certificate of foreign resident registration : Foreign applicants should submit an official document indicating their residence status issued by the head of their residential city/ward/town/village, or a photocopy of visa indicating their residence status.

(L) Self-addressed Forms : Write your postal number, address, and name in the form designated by the Graduate School of Engineering (Form No.8).

[Note]

(1) No changes are allowed in the application documents once they have been received. The entrance exam fee will not be returned to an applicant except the case where the applicant did not apply or the application was not accepted.

(2) Make sure that documents created in a foreign language other than English should be accompanied by Japanese translation with the translation accreditation issued by the public institution such as the diplomatic facilities of Japanese or foreign government.

(3) Applicants should select a desired faculty member from the "Syllabus" and indicate the name in the admission application form. Without the name of the desired faculty member's name, the application documents will not be accepted. Also, applicants should closely contact the expected faculty member and create a research proposal.

#### 4. Screening Methods

Admission will be determined based on the results of academic examination together with the submitted documents.

The academic examination will take place through oral examination and interview.

(1) Content of a master thesis or summary of research program

Examined as to whether or not the applicant has basic academic skills required for the course.

(2) English capability (for applicants graduated from a foreign university, both English and Japanese language skills are examined)

Examined as to whether or not the applicant has language skills required for the course.

(3) Content of research proposal

Examined as to whether or not the research plan meets the doctoral degree to be awarded.

#### 5. Date and Place for the Interviews

Date	Place	Remark
<b>February 16, 2011 (Wed)</b>	Kobe University, Graduate School of Engineering Building	Applicants will be notified of time & place for the interview at a later date.

**【Access to Kobe University Graduate School of Engineering Building】**

Hanshin "Mikage" sta. JR "Rokkomichi" sta. or Hankyu "Rokko" sta.

Kobe Municipal Bus No. 16 (bound for Rokko Cable)

Shindai Kokusai Bunka Gakubu Mae, 5 min on foot to the Rokkodai Campus



## 6. Announcement of Successful Applicants

### February 22, 2011 (Tue) 13:00

The results will be announced both on the bulletin board and via the website of Kobe University Graduate School of Engineering.

<http://www.office.kobe-u.ac.jp/eng-ofc/kym/examinee.html>

※Successful applicants will receive the acceptance letter. Inquiries will not be accepted via telephone.

## 7. Admission Procedure

### (1) Admission procedure period and admission documents

The admission procedure period is scheduled to be March 16, 2011. The details will be mailed to each successful applicant around first March 2011 with necessary documents for the procedure.

### (2) Where the admission procedure is held

Kobe University Centenary Commemorative House (Shindai Kaikan) (scheduled)

### (3) Fees

Division		In Japanese yen	Remark
Admission fee		282,000	Admission fee should be paid during the admission procedure period.
Tuition fee	For semester	267,900	Refer to the “General Information for Successful Applicants” which will be sent around mid March mester 2011. [In case the tuition is revised, the new fee is applied from the time of the revision.]
	Annual total	535,800	

(Note) The amounts quoted above apply to 2010.

[Note]

### (1) The admission of applicants who fall under the following items may be cancelled.

(A) Applicants who made a false declaration

(B) Applicants who did not complete the admission procedure indicated above.

(C) Applicants who did not receive a master’s degree or a professional degree by March 31, 2011.

### (2) The admission fee already paid will not be returned for any reason.

### (3) Admission fee and tuition fee are not required for Japanese government-sponsored international students who will continue to be so after enrollment.

## 8. Eligibility Screening

Those who intend to apply under the requirements “2. Eligibility Screening (5) or (6)” will be screened by the following documents submitted.

### (1) Documents necessary for screening

(A) Application Form for Examination of Qualification : the application form designated by the Graduate School of Engineering (Form No. 9)

(B) Graduation certificate created by the head of faculty or the principal of the university you graduated from

(C) Curriculum Vitae : the form designated by the Graduate School of Engineering (Form No. 2)

(D) History of research : created by immediate manager or representative of education/research institute or company where the research was conducted. If such a certification is unavailable, an application written by the applicant can substitute it. Use the form designated by the Graduate School of Engineering. (Form No. 10)

(E) Research experience (A4): the outline of thesis that is “an equivalent of master’s thesis”. A set of copies written in both Japanese (approx. 2,000 words) and English (approx. 1,200 words), with a cover sheet

designated by the Graduate School of Engineering (Form No. 11). For foreign applicants, only English copy suffices.

- (F) Materials of research achievements : Index of thesis and separate print (photocopy acceptable), which are the basis of the research achievements, along with references of other achievements, if any. In case of collaborative research, attach the material clearly indicating the portion the applicant was in charge.
- (G) Research proposal (A4) : a copy of report indicating the field and research the applicant would like to explore, written either in Japanese (approx. 2,000 words) or English (1, 200 words) with a cover sheet designated by the Graduate School of Engineering (Form No. 7).

Note that those who have completed a 6-year course of medical college, dental college, or veterinary medicine are not required to submit the abovementioned (D), (E) and (F).

## (2) Period and place for submission

Your application documents must be submitted in person or by mail (simplified registered mail marked "Application Form for Examination of Qualification" in red on the envelope) by Tuesday, January 11, 2011 to the Student Affairs Office of the Graduate School of Engineering.

Office hour (for those who hand in): Monday through Friday: 9:00-12:00 & 13:00-17:00

## (3) Announcement of the screening results

Successful applicants will be notified of the result by Monday, January 17, 2011.

## 9. Others

### 1. Admission Fee Payment Exemption

Applicants recognized as having extreme difficulties for the payment of the admission fee who fall under any of the following items and make the relevant application may be exempted from the payment of all or half the admission fee upon screening. (low income only is not qualified for the exemption.)

- (1) The person mainly responsible for paying school expenses for the applicant having passed away within the year prior to admission.
- (2) The applicant or the person mainly responsible for paying school expenses for the applicant has suffered from flood or storm damage within the year prior to admission.
- (3) The applicant has the reason corresponding to either of the above-mentioned and recognized by the university as having the reason.

### 2. Admission Fee Payment Deferral

Applicants who fall under any of the following items and make the relevant application may be able to defer payment of the admission fee for a certain period upon screening.

- (1) Applicants, for whom the payment deadline has become difficult due to financial reasons, and recognized as having excellent academic records.
- (2) Applicants recognized for whom payment by the payment deadline has become difficult because the person mainly responsible for paying school expenses for the applicant have passed away within the year prior to admission.
- (3) Applicants recognized for whom payment by the payment deadline has become difficult because the applicant or the person mainly responsible for paying school expenses for the applicant has suffered from flood or storm damage within the year prior to admission.
- (4) Applicants recognized for whom payment by the payment deadline has become difficult due to unavoidable circumstances other than indicated above.

### 3. Admission Fee Payment Exemption

Applicants who fall under any of the following items and make the relevant application may be exempted from the payment of all or half of the admission fee upon screening.

- (1) Applicants recognized as having difficulty for the payment due to financial reasons and having excellent academic records.
- (2) Applicants, except those who fall under (1), recognized as having extreme difficulty for the payment

due to any of the following circumstances.

- i The person mainly responsible for paying school expenses for the applicant having passed away within a year prior to admission (when concerning the exemption of tuition fee of the term of the admission).
- ii The applicant or the person mainly responsible for paying school expenses for the applicant has suffered from flood or storm damage within a year prior to admission (when concerning the exemption of tuition fee of the term of the admission).
- iii The applicant has the reason corresponding to either of the above-mentioned and recognized by the university as having the reason.

#### 4. Handling of personal information

- (1) Kobe University complies with the legislation such as “Act on the Protection of Personal Information Held by Independent Administrative Legal Entity” in using the personal information on applicants, and handles it based on the “Guideline on the Control of Personal Information Held by Kobe University”.
- (2) Personal information including the individual results of screening shall be used for screening (application procedures, conducting screening), announcement of successful applicants, enrollment procedures, and materials for reviewing the screening methods for the future.
- (3) Personal information of only enrolled students provided for the application will be used for supporting the students after the enrollment (health management, tuition fee exemption or scholarship application, etc), educational purposes such as academic instruction, tuition-fee related affairs, and other corresponding work.
- (4) Part of the operations may be outsourced to an agency. (Hereafter called “Agency”). In the case of outsourcing the operations, all or part of the personal information provided will be provided to such an Agency with nondisclosure obligation within a certain limit necessary for the Agency to execute the operations.

#### 5. Preventive Measures Against Measles and Rubella

**Submission of the “Immunization Certificate” of measles and rubella vaccines (or combination vaccine of both measles and rubella vaccines such as MR vaccine), or “Antibody Test Certificate” of measles and rubella**

To prevent a possible outbreak of Measles and Rubella on campus after enrollment, Kobe University requires all students to submit either one of the following certificates. Students entering in April must submit either one of them at the routine medical check-up for new students scheduled in early April, while students entering in October must do so at the routine medical check-up scheduled in October

- ① Vaccination Certificate given to students who were inoculated with measles and rubella vaccines, twice for each. (Immunization Certificate)
- ② Vaccination Certificate given to students who were inoculated with measles and rubella vaccines once for each within the last five years (Immunization Certificate)
- ③ A document given to students who display adequate antibody titer in their blood to prevent developing measles or rubella within the last five years (refer to the following table). (Antibody Test Certificate)

If the antibody titer level is below the requirement yet you cannot be inoculated with the vaccine for any reason such as illness or constitution, please present the document explaining why (for example, a certificate issued by the doctor).

- \* “Vaccination Certificate” refers to a document issued by an accredited medical institute that states the type of vaccine used and the date of inoculation.
  - \* The MR vaccine (a combination vaccine of both measles and rubella) suffices for the vaccines of ① and ②.
  - \* “Antibody Test Certificate” is a document issued by an accredited medical institute showing the measurement methods and values for the antibody titer in the blood specified in the below table, and the measurement values meeting the “protective antibody titer values”.
  - \* The combination of the documents ①, ②, and ③—for example, the combination of “Vaccination Certificate” for measles(①) and “Antibody Test Certificate” for rubella (③)—is accepted.
- The maternity passbook in which the type of vaccines and the date of inoculation are specified can be used as documents for ① or ②. If it only indicates the past medical history (the record of suffering the diseases) without the test results (a proof of the diagnosis), submit either “Antibody Test Certificate” (③), or “Vaccination Certificate” (① or ②) after the inoculation.
- \* “Vaccination Certificate”, “Antibody Test Certificate”, and “A document issued by the doctor stating you cannot be inoculated with the vaccines for reason such as illness or constitution” will not affect the admission decision of screening.

Methods and Judgment Standard for Values of Protective Antibody Titer in Blood that Prevents Measles and Rubella

Division	Measurement Method	Judgment Standard	Remark
Measles	IgG—EIA	8.0 and above, positive	Has to show positive in one of the three measurement methods
	PA	128 and above, positive	
	NT	4 and above, positive	
Rubella	HI	32 and above, positive	

Please use the methods indicated above to judge the titer in the blood for measles and rubella. The protective antibody value differs according to the measuring method. Also, note that the values are higher than the values considered as simply positive. If your antibody titer level is below these values, please take the required vaccination and submit “Vaccination Certificate”.

When you go to a medical institute, please show this vaccination notification to the doctor and receive required certificates (in particular, the measurement methods and judgment standards for the antibody test).

For further information concerning the infection-control measures, contact  
 Kobe University Medical Center for Students Health      TEL: 078-803-5245  
 Kobe University Student Affairs Division                      TEL: 078-803-5219

- \* If you have any questions concerning the application, please contact us below.

Kobe University, Graduate School of Engineering,  
Students Affairs Office  
1-1 Rokkodai-cho, Nada-ku, Kobe 657-8501  
TEL (078) 803-6350  
e-mail: eng-kyomugakusei@office.kobe-u.ac.jp

### ◎Special Education System for Students Entering From Workplace

Recently, increasing number of engineers and researchers in workforce want continued education and training as well as obtaining doctoral degrees in graduate school. However, education programs of graduate schools usually require them away from their workplace to focus on the graduate program for three years, which is likely to limit their learning opportunities. On the other hand, the "Graduate School Foundation Standard, Article 14" stipulates that "When special educational measures are recognized necessary in the courses of the Graduate School, appropriate educational measures can be taken such as providing classes or research guidance during night or certain periods." considering the students from workplace. Based on these backgrounds, the Doctoral Course of Graduate School of Engineering has conducted the special educational measures as stipulated by the statement for those students since 1995. (\*). The following items summarize the program.

1. Part of class by a faculty member upon an agreement of the member, and part of research guidance by academic staff upon an agreement of the staff, can be provided during night or a certain period.
2. If the faculty member recognizes that the thesis has been well under progress, and that superior facilities or equipment for the research are provided in the relevant company where outstanding performance can be expected, the student can conduct research within the company.

(\*) Then, they were provided by the "Graduate School of Natural Science", the predecessor of the Graduate School of Engineering.

## II Introduction of the Doctoral Course of Graduate School of Engineering

### **1. Philosophy and Features of Curriculum**

The doctoral degree program of the Graduate School of Engineering provides highly-specialized education integrating the master's degree program based on the policy of cultivating human resources after the course completion; at the same time, an individual-based instruction is provided for new students from the doctoral course. The Graduate School of Engineering features the curriculum organization as indicated below.

The current courses of the Master's and the Doctoral Degree Program, which meet the students' demand for learning while covering subdivided and diversified disciplines of engineering, are the outline of the curriculum of the Graduate School of Engineering, into which the course work and multi-major education are incorporated.

### **2. Features of Doctoral Program Education**

Multi-major Course :

Multi-major course is designed to provide education to quickly adapt to the industrial structure's rapid changes and the highly advanced interdisciplinary fields. In this course, cross-department sub-courses are provided to foster the human resources who are educated through a department and several sub-departments of the students' choice, in order to foster highly specialized professionals in the engineering field, who are highly creative with multifaceted perspectives. Each sub-course is accredited according to the requirements of each course; and those who complete the course are granted a certificate of accreditation, which is handled separately from the requirements for completing the doctoral degree program.

Fostering the Interdisciplinary Perspectives :

The combination of "Advanced Study on Advanced Integrated Science II" (optional course)—the cross-graduate-school course of our five Graduate Schools of natural science (Science, Engineering, Agriculture, Marine, and System Informatics)—and specialized course (optional course) of other Graduate Schools or other departments fosters the interdisciplinary perspectives.

Measures Taken for New Students Enrolled from Other Graduate Schools of Kobe University :

New students who enrolled in the doctoral course of the Graduate School of Engineering from other graduate schools of Kobe University may be instructed to take courses in the master's degree program if considered necessary.

Doctoral Degree Accreditation Process :

We provide the research progress presentation for research concept, research progress, and future research plan during both the 1st year and 2nd year in order to instruct the students to create appropriate doctoral thesis. In the 3rd year, the research result presentation is conducted, and if the research result is acknowledged as superior, the student can proceed to submitting the doctoral thesis and reviewing (including the doctoral thesis presentation). The entire department makes concerted effort in conducting research progress presentation, research results presentation, and the doctoral thesis presentation so that each department can be involved in guiding the students' research. For those who are finished early, the research result presentation and the doctoral thesis presentation are conducted during the 1st or the 2nd year.

### **3. Departments and Divisions of the Graduate School of Engineering**

The Graduate School of Engineering has five departments: Architecture, Civil engineering, Electrical and Electronic Engineering, Mechanical Engineering, and Chemical Science and Engineering.

( 1 ) Architecture

The Department of Architecture aims to create a variety of spaces and areas in daily lives and social lives. The targets include not only the requirements of current days—comfort and convenience as part of environment, or enough strength for safety—, but the creation of architectures that are environmentally-friendly allowing for the sustainable development is also sought after in these days. Instead of focusing only on successive creation of building in the past, what is needed now is to create new buildings that can coexist more harmoniously with the earth and the natural environment, while, at the same time, succeeding the human environment that has been built by the humans and the society for long years until now. In this department, based on the human's eternal challenges as such, we provide the education and research to foster the human resources who can consider architecture not only as single entity but also as part of regional and urban spaces as well as ecological environment directly connected with the earth. To this end, The Department of Architecture consists of the following four divisions: Spatial Design, Architectural Planning History and Theory, Engineering of Building

Structures, and Architectural Environment Engineering.

#### Spatial Design

The Division of Spatial Design aims to provide synthetic theory establishment and practical education and research on the creation of space, which include architectural and urban design, housing and community design, structural engineering and design building management.

#### Architectural Planning, History, and Theory

The Division of Architectural Planning, History, and Theory provides the basic education and research on the basic architectural design including history and theory of architecture, conservation and renovation planning of historical environment, planning of human living, housing and regions, urban and architectural safety planning, architectural planning, and urban planning.

#### Engineering of Building Structures

The Division of Engineering of Building Structures provides education and research on structural safety engineering, dynamic behaviors and architectural analyses of building materials (members and joint parts of structures), quake-resistant safety of structures and vibration suppression, improvement of performance, and structural systems.

#### Architectural Environmental Engineering

The Division of Architectural Environmental Engineering provides the education and research on analysis and control of acoustical, thermal, aerial, and lighting environment in buildings and analysis and planning of regional and urban environments.

### ( 2 ) Civil Engineering

We welcome students who are ambitious to become the pillars of public service demanded by the citizen and society, to foster the human resources with broader interdisciplinary perspectives embracing the traditional civil engineering fields, as well as high-level practical skills and expertise. “New Civil Engineering (public engineering) in the 21 century” focuses on engineering of wider fields embracing urban redevelopment, citizen participation, and globalization, based on the education of creating safe cities and regions against natural and social disasters, and the education of conserving the environment where cities and regions living in symbiosis with nature, and the education of maintaining and reviving urban facilities. To this end, the Department of Civil Engineering consists of Engineering of Human Security, and Engineering of Environmental Symbiosis.

#### Engineering of Human Safety

As basic research fields to create safe cities and regions against natural disasters and social disasters such as terrorism and accidents, the Division of Engineering of Human Safety provides education and research on structural safety engineering, geotechnical safety engineering, and transportation system engineering concerning social safety, and geo-disaster engineering, earthquake-disaster prevention engineering, and flood control engineering concerning the prevention of urban disasters.

#### Engineering of Environmental Symbiosis

As basic research fields to aim for conserving environment and maintaining/reviving urban facilities that allows for cities and regions living in symbiosis with nature, the Division of Engineering of Environmental Symbiosis provides education and research on environmental fluid engineering, hydrospheric environment engineering, and geo-environmental engineering concerning the environmental preservation of cities and regions, and wide-area environment engineering, urban safety & security engineering, and urban management engineering concerning the maintenance and revival of cities and regions living in symbiosis with the nature.

### ( 3 ) Electrical and Electronic Engineering

The Department of Electrical and Electronic Engineering shares the academic as well as technological bases with various research fields including computer information processing system, information and telecommunications, computer science, quantum mechanics, and optical electromagnetic theory. In the department, we aim for fostering the human resources with highly specialized basic academic skills and basic research capabilities in the master’s degree program; and we aim for fostering the human resources processing further advanced and pioneering research capabilities in the doctoral degree program. To this end, we provide the systematic education and research—from basics to most advanced—on science and technology that assume the core role of the modern society; and the basic theories and technologies required for establishing the new nano-materials, devices,



hardware, software, wearable computing technology, and system engineering for the coming highly advanced information society, and its progress and new development. To be more specific, the Department of Electrical and Electronics Engineering consists of two divisions, Physical Electronics, and Computer and Information, which are functionally integrated and provide the education and research on 1) electronics materials properties and device physics as the basis of electronics, 2) theories and technologies of information exchange, transmission, and processing, 3) conversion, transmission, and control of electrical energy, and basics of new energy system.

#### Physical Electronics

The Division of Physical Electronics provides education and research on solving the mechanism of quantum mechanical interaction between electrons and light in various electrical materials such as semiconductors, developing new electrical materials, building the models of nano-devices and molecular devices incorporating the quantum behaviors of electronics, and developing new devices and systems with a view to applying the electrical energy.

#### Computer and Information

The Division of Computer Information provides education and research on information mathematics, information processing, information transmission, and information recognition to realize highly advanced computer information processing and communication systems, as well as the design and configuration of computer information device including the large-scale integrated circuit (LSI).

### ( 4 ) Mechanical Engineering

Mechanical engineering is a discipline that serves to the bases for supporting the industrial society and the information society. In the Department of Mechanical Engineering, we provide the education and research on a wide range of mechanical and related fields from design, manufacturing, and control of the mechanical system that is highly complicated and diversified, while maintaining the harmony with the society and the environment, by synthesizing and integrating a number of cutting-edge and highly functionalized elemental technologies from both hardware and software including the environment, energy, nanotechnology, robotics, and design and manufacturing systems.

In the master's degree program, we foster the human resources possessing advanced, specialized basic academic skills and basic research development capability as well as high moral value and an international mindset required for the leader of the future society; in the doctoral degree program, we foster the human resources who have the interdisciplinary sense and capability of performing creative researches and development. To this end, the Department of Mechanical Engineering consists of the following three divisions: Thermo-Fluid Dynamics, Mechanics and Physics of Materials, and Design and Manufacturing.

#### Thermo-Fluid Dynamics

The Division of Thermo-Fluid Dynamics aims to solve the complicated, diversified generative mechanism and transportation mechanism of the fluid energy and thermal energy, to achieve their higher efficiency, and also provides the general education and research on thermal and fluid energies from a wider perspective of the environment by systematically reviewing energy conversion.

#### Mechanics and Physics of Materials

The Division of Mechanics and Physics of Materials provides education and research with a view to acquiring the basics of nanotechnology through evaluating the function, strength, and stability of the properties of solid structure, composition, and dynamics, by defining them from micro-, mezzo- and nano-hierarchies and constructing their organic interrelations, and through designing the function of the surfaces and interfaces.

#### Design and Manufacturing

The Division of Design and Manufacturing provides education and research on the system design, system analyses, intelligent robot, control theory, emergent system, and next-generation processing technology covering wide phenomena—from micro to macro—of mechanical element technology, mechanical system, and social systems, and also the integration of them.

### ( 5 ) Chemical Science and Engineering

The Department of Chemical Science Engineering offers consistent education and research by, based on the new norms, extensively integrating the range of contents including the basic chemistry of molecular levels, the provision of functionality for chemical substances and materials consisting of molecules, discovery of functionality, engineering application of biological functions to the creation of substances and manufacturing

technologies, creating the actual macro industrial scales, and manufacturing technologies and systems, to foster researchers and engineers who will lead the chemical industry of the future on a global scale. We provide education and research on the following: the analyses of structure and properties of molecular/nano order of chemical substances; creation of substances and materials of advanced functionality; developing biomaterials including biotic function applied technology and bioreactors; enhancing chemical engineering, manufacturing technology, and separation/purification technologies; and basic and application of the collective process system analyses. To this end, the Department of Chemical Science and Engineering consists of the following divisions: Applied Chemistry and Chemical Engineering.

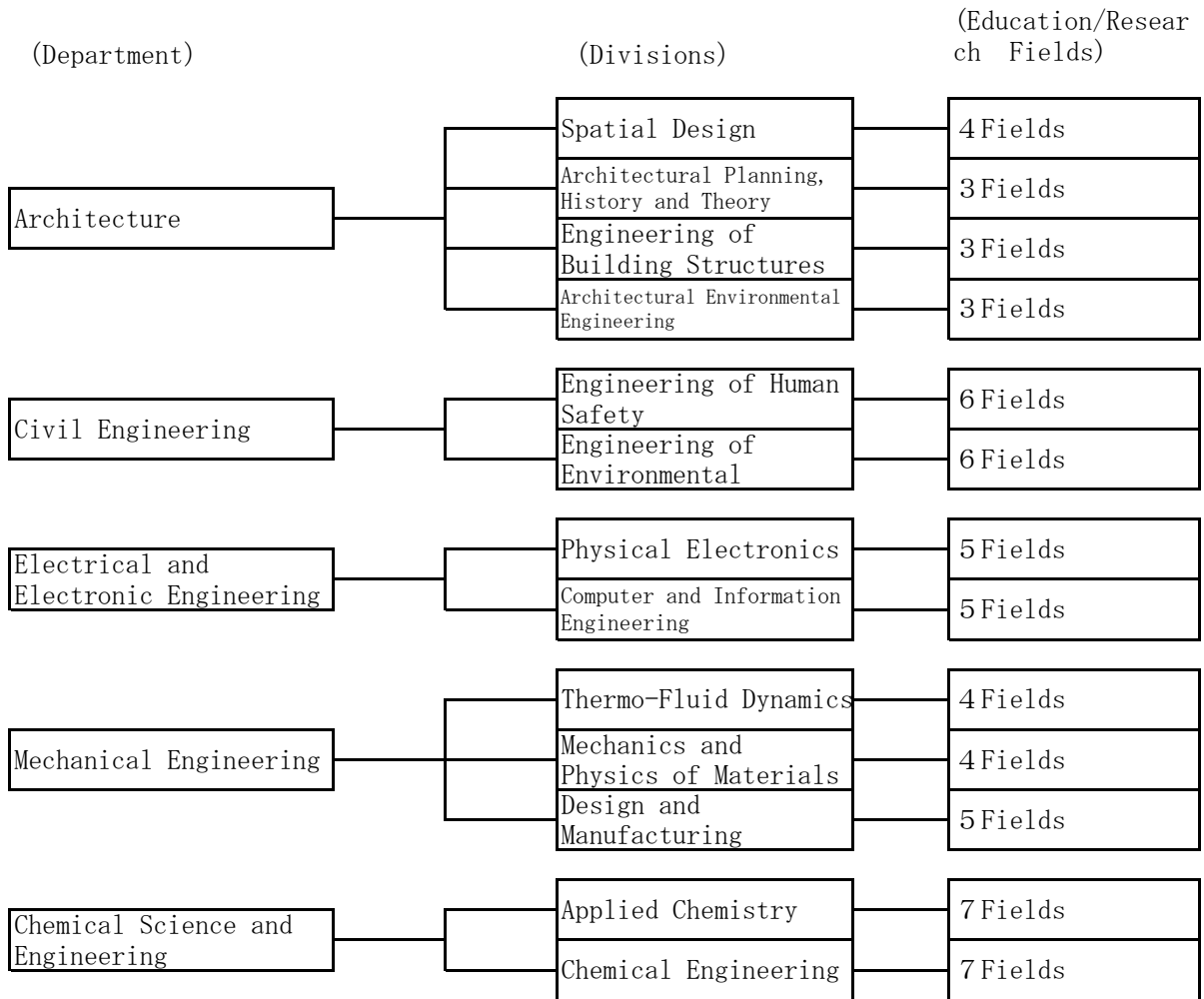
#### Applied Chemistry

The Division of Material Science provides education and research on mechanism clarification of functional development and new substances creation technology based thereon, from the engineering perspective, by providing precise, advanced functionality to chemical substances and materials, and creation of functionality, designed for a wide range of groups including from atomic, molecular level substances to nano-, mezzo-, and macro-substances, with an aim to combining the world of atoms and molecules made thereof and various functions created by the convergence of molecules.

#### Chemical Engineering

The Division of Chemical Engineering provides education and research on useful substances, high efficiency of energy, and development of low environmental load manufacturing process by developing new materials and reactive, catalytic substances, establishing the control method of reactive, transfer phenomena, and creating new manufacturing process, based on the finding of intermolecular interaction, biological molecular functions/substances and energy transfer phenomena during the substance and energy conversion process based on the chemical and biological reaction.

Department • Divisions • Education/Research Fields



5 Department

13 Divisions

62 Fields

## Departments and Divisions Guidance

Department	Divisions	Education/Research Fields	Staff	Subject	
Architecture	Spatial Design	Architectural and Urban Design	Endo Shuhei	Theory on Architectural Space Composition	
			To be fixed	Planning and Design of Urban Space	
		Housing and Community Design	Yamazaki Juichi	Theory of Community Planning	
			Miwa Koichi	Urban Improvement Design	
		Structural Engineering and Design	To be fixed	Design Theory of Spatial Systems	
		Building Management	Fujinaga Takashi	Composition of Structural Members	
	Ohtani Yasuhiro		Theory of Structures' Failure		
	Architectural Planning, History and Theory	History and Theory of Architecture, Theory of Historical Environments	Adachi Hiroshi	Theory and History of Urban Environments and Architecture	
			Kuroda Ryuji	Cultural Environment of Architecture	
		Planning Theory of Built Environment	Shiozaki Yoshimitsu	Theory of Built Environments	
			Kondo Tamiyo	Environmental Planning for Housing and Settlement	
		Urban and Architectural Safety Planning	Hokugo Akihiko	Theory of Environmental Disaster Prevention	
			To be fixed	Fire Safety Engineering for Buildings	
	Engineering of Building Structures	Structural Performance Engineering	To be fixed	Analysis of Spatial Structures	
			Sun Yuping	Theory of Structures' Stability	
			Tanaka Tsuyoshi	Structural Design of Spatial Structures	
		Structural Control in Dynamics	Fujitani Hideo	Sesmic Hazard Analysis	
			To be fixed	Earthquake Resistant Structural Analysis	
		Structural Systems Engineering	Namba Hisashi	Creation Theory of Spatial Systems	
			Tani Akinori	Function Theory of Spatial Systems	
		Architectural Environmental Engineering	Planning of Acoustical and Lighting Environments	Morimoto Masayuki	Spatial Hearing
				Sakagami Kimihiro	Noise Control Engineering
			Thermal Environmental Planning	Matsushita Takayuki	Thermal Environmental Planning in Buildings
				Takada Satoru	Environmental Planning Based on Human Response
			Planning of Urban Environment and M&E Services	To be fixed	Thermal Environmental Planning in Urban Areas
	Takebayashi Hideki			Thermal Environmental Engineering in Urban Areas	
	Cooperative Division	Disaster Mitigation Planning	To be fixed	Environmental space design for disaster reduction	
			Kubota Katsuaki	Theory of EMS and Evacuation System	

## Departments and Divisions Guidance

Department	Divisions	Education/Research Fields	Staff	Subject	
Civil Engineering	Engineering of Human Safety	Structural Engineering for Urban Safety	Kawatani Mitsuo, Miki Tomohiro	Adaptive Structural Control	
		Geotechnical Engineering for Urban Safety	Shibuya Satoru	Design of Soil Structures and Foundations	
			Kato Shoji	Ground Disaster Prevention	
		Transport Systems Engineering	Kita Hideyuki	Theory of Transportation System Planning	
			Iryo Takamasa	Advanced Theory of Socio-Economic Systems	
		Geotechnical Engineering for Disaster Reduction	Tanaka Yasuo	Land Reclamation & Geotechnical Engineering	
			Yoshida Nobuyuki	Instability and Stabilization of Cut, Filled and Reclaimed Land	
		Earthquake Disaster Mitigation Engineering	Akutagawa Shinichi	Underground Spatial Structure	
			To be fixed	Earthquake Disaster Mitigation Engineering	
			Kuwata Yasuko	Vibration Theory of Spatial Structures	
		Disaster-prevention Engineering for River Basin	Fujita Ichiro	Analysis of Hydrospheric Environments	
			Oishi Satoru	Water Resources Management	
		Engineering of Environmental Symbiosis	Environmental Fluid Engineering	Nakayama Akihiko	Regional Geofluid Mechanics
				Nakayama Akihiko	Theories on Hydraulic Planning
	Engineering of Hydrospheric Environment		Michioku Kohji	Limnological Environment	
			Miyamaoto Hitoshi	Management of Coastal Environments	
	Geo-environmental Engineering		To be fixed	Advanced Slope Stability Methods	
			Uenishi Koji	Geo-Hydraulics	
	Urban Preservation Engineering		Iizuka Atsushi, Kawai Katsuyuki	Geomechanics for Underground Structures	
	Urban Preservation Engineering		Morikawa Hidenori	Structural Diagnostics	
	Urban and Transport Planning and Management		Asakura Yasuo	Space-Time Analysis of Travel Behaviour	
Otazawa Toshimori			Urban Spatial Analysis		

## Departments and Divisions Guidance

Department	Divisions	Education/Research Fields	Staff	Subject
Electrical and Electronic Engineering	Physical Electronics	Mesoscopic Materials	Hayashi Shinji	Mesoscopic Materials
			Fujii Minoru	Optoelectronic Properties of Condensed Matter
			Moriwaki Kazuyuki	Microfabrication Science and Technology
			To be fixed	Structure of Surfaces
		Photonic Materials	To be fixed	Photonic Materials I
			Kita Takashi	Photonic Materials II
		Quantum Functional Engineering	Kitamura Masatoshi	Quantum Devices I
			Souma Satofumi	Quantum Devices II
		Nano-Structure Electronics	Ogawa Matsuto	Nano-Structure Electronics I
			Tsuchiya Hideaki	Nano-Structure Electronics II
		Electromagnetic Energy Physics	Yasaka Yasuyoshi	Advanced Plasma Applications
			Takeo Hiromasa	Physical Analysis on Electric Energy
	To be fixed		Kinematics of High Energy Particles and Their Acceleration	
	Computer and Information Engineering	Integrated Circuit Information	Numa Masahiro	Integrated Circuit Architecture
			Kuroki Nobutaka, Hirose Tetsuya	Integrated Circuit Design
		Computer Engineering	Tsukamoto Masahiko	Distributed Intelligence and Multi-Agent Systems
			Terada Tsutomu	Intelligent Agents
		Information and Communication Engineering	Morii Masakatu	Information Theory
			Kuwakado Hidenori	Knowledge Assisted Coding
		Algorithms	Masuda Sumio	Advanced Data Structures
			Yamaguchi Kazuaki	Design of Algorithms
		Intelligent Learning Theory	To be fixed	Learning and Inference
			Ozawa Seiichi	Theory of Brain-like Learning
Cooperative Division	Functional Thin-Film Engineering	Adachi Hideaki	Thin Film Engineering for Oxide Devices	
		Kitabatake Makoto	Atom-Controlled Thin Film Materials	
		Yamada Yuka	Opto-Electronic Thin Film Semiconductor Engineering	

## Departments and Divisions Guidance

Department	Divisions	Education/Research Fields	Staff	Subject	
Mechanical Engineering	Thermo-Fluid Dynamics	Applied Fluid Engineering	To be fixed	Fluid Energy Morphology	
			Kataoka Takeshi	Fluid Flow Phenomena with High-Velocity and Phase Change	
		Multiphase Thermo-fluid Dynamics	Takenaka Nobuyuki	Multiphase Thermal Energy Transport	
			Asano Hitoshi	Thermal Energy System	
		Energy Conversion Engineering	Hirasawa Shigeki	Energy Conversion Theory	
			Kawanami Tsuyoshi	Thermal Engineering in Environmental Problems	
		Energy and Environmental Engineering	Tomiyama Akio	Analysis of Complex Thermal-Hydraulic Phenomena	
			Hosokawa Shigeo	Complex Flow Diagnostics	
		Mechanics and Physics of Materials	Solid Mechanics	Sakagami Takahide	Hierarchical Structures of Engineering Materials
				Hasebe Tadashi	Functions and Forms of Engineering Materials
	Nakai Yoshikazu			Environmentally Assisted and High Temperature Strength of Materials	
	Fracture Control Engineering		Tanaka Hiroshi	Interface Mechanics	
			To be fixed	Nano Structural and Functional Materials Science	
	Material Science		To be fixed	Electronic Control in Nanostructured Materials	
			Tagawa Masahito	Synthesis of Functional Surfaces	
			Fujii Yoshikazu	Physical Analysis of Nanometric Structures	
			Katsushi Tanaka	Nano- and Microengineering	
	Surface, Interface and Tribology		Yashiro Kisaragi	Strength and Fracture of Nano and Micro Materials	
	Design and Manufacturing	Complex Mechanical Engineering	Yokokohji Yasuyoshi	Emergent Theory of Dynamic Systems	
			Fukao Takanori	Intelligent Control of Mechanical Systems	
		Machine Dynamics	To be fixed	Creation and Optimization of Mechanism	
			Adachi Kazuhiko	Emergent Theory of Dynamic Functions	
			Matsuda Mitsumasa	Analysis of Biological Dynamics	
		Computer Integrated Manufacturing	Shirase Keiichi	Future Manufacturing Systems	
			Shibasaka Toshiro	Advanced Manufacturing Processes	
		Intelligent Artifacts and Manufacturing Systems	Isono Yoshitada	Nano/Micro System Engineering	
		Creative Design	Taura Toshiharu	Design Theory and Methodology of Artifactual Environments	
			Tsumaya Akira	Adaptive Intelligent Systems	
			Yamamoto Eiko	Database Systems for Intelligent Design	
		Cooperative Division	Intelligent Production Systems	Narazaki Hiroshi	Information Technology for Industrial Applications
	Otsuka Yoshihisa			Intelligent Control in Production Systems	
	Nakayama Makishi			Information and Control Theory	
Adaptive Function Model	To be fixed		Welfare Information Technology		
	Sawai Hidefumi		Perception Mechanism		
	Wang Zhen		Information Transmission Devices		
Collaborative course on wisdom-based manufacturing	Nagao Yoichi		Methodology for Practical Development of Technology		
	To be fixed		Methodology for Practical Solution of Problem		

## Departments and Divisions Guidance

Department	Divisions	Education/Research Fields	Staff	Subject	
Chemical Science and Engineering	Applied Chemistry	Applied Physical Chemistry	Ueda Yasukiyo	Thin Film Formation of Organic Molecules	
			Ishida Kenji	Structural Chemistry in Molecular Thin Films	
		Applied Inorganic Chemistry	Mizuhata Minoru	Functions of Multi-phase Systems	
			Kajinami Akihiko	Materials Chemistry of Heterogeneous Systems	
		Applied Organic Chemistry	Mori Atsunori	Organic Reaction Mechanisms	
			Okada Etsuji	Synthesis of Organic Molecules	
			Kamitori Yasuhiro	Reactions for Organic Materials	
		Applied Polymer Chemistry	Nishino Takashi	Functional Polymers	
		Advanced Analytical Chemistry	Nariai Hiroyuki	Advanced Synthetic Chemistry of Inorganic Polymers	
			To be fixed	Green Chemistry	
		Advanced Polymer Colloids	To be fixed	Selected Topics in Functional Polymer Particles	
			Minami Hideto	Physical Properties of Functional Colloid Systems	
		Advanced Molecular Chemistry	Takeuchi Toshifumi	Reaction-Site Design	
			Ohya Tooru	Design of Bio-functional Materials	
	Chemical Engineering	Catalysis and Catalytic Reaction Engineering	Nishiyama Satoru	Design of Catalysis and Control of Catalytic Reaction	
			Ichihashi Yuichi	Catalysis and Surface Science of Supported Metals	
		Transport Science and Engineering	Ohmura Naoto	Analysis of Nonlinear Phenomena	
			Imakoma Hironobu	Diffusional Unit Operations	
			To be fixed	Material Function Engineering	
		Process System Engineering	Matsuo Shigenobu	Physical Property Analysis	
		Fluid and Particle Engineering	Suzuki Hiroshi	Control of Transport Phenomena	
			Komoda Yoshiyuki	Physico-chemical Properties of Fluids	
		Biochemical Engineering	Kondo Akihiko	Control of Bioreactions	
			Ogino Chiaki	Bioreaction Process Engineering	
		Bioprocess Engineering	Yamaji Hideki	Control of Molecular Interactions	
			To be fixed	Biofunctional Engineering	
		Materials Processing Engineering	Matsuyama Hideto	Process Design Engineering	
			Maruyama Tatsuo	Process System Analysis	
			Localized Reactions and Physical Properties of Materials	Xu Qiang	Glass Materials for Photonics
				Yumoto Noboru	Structure-Function Relationship of Biomolecules
	Tawa Keiko			Catalytic Organic Chemistry	
	Chemical Energy Conversion Process		Sakai Tetsuo	Technology of Energy Development	
			Ioroi Tsutomu	Materials for Energy System	
			Akita Tomoki	Solid State Electrochemistry	
	Biofunctional Engineering		Satake Honoo	Post-genome Applied biology	
			Murata Yoshiko	Plant Molecular Biology	
			Kanse Kenji	Structural Molecular Biology	
	Pharmaceutical Design and Production Engineering		Sako Kazuhiro	Pharmaceutical Research & Technology	
			Mori Atsuhide	Process Engineering on Parenteral Dosage Forms	
			Yamashita Kazunari	Process Engineering on Oral Dosage Forms	
Chemical and Biological Sensing	To be fixed		Chemical Sensing		
	To be fixed		Bioelectronics		