FACULTY OF ENGINEERING
GRADUATE SCHOOL OF ENGINEERING
KOBE UNIVERSITY

- ARCHITECTURE
- CIVIL ENGINEERING
- ELECTRICAL AND ELECTRONIC ENGINEERING
- MECHANICAL ENGINEERING
- CHEMICAL SCIENCE AND ENGINEERING
- COMPUTER SCIENCE AND SYSTEMS ENGINEERING

Message

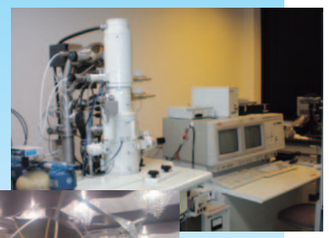
Welcome to the Graduate School / Faculty of Engineering

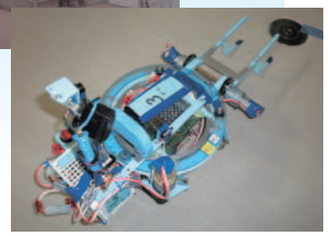
Dean,
Graduate School
of Engineering
Professor
TOMIYAMA Akio

The Faculty of Engineering consists of six departments: Department of Architecture, Department of Civil Engineering, Department of Electrical and Electronic Engineering, Department of Mechanical Engineering, Department of Chemical Science and Engineering, and Department of Computer Science and Systems Engineering. The Graduate School of Engineering consists of the first five departments, excluding Computer Science and Engineering, and offers a wide variety of education and research ranging from fundamental science and liberal arts to innovative engineering for the development of human resources playing leading roles in the realization of a sustainable, safe, and secure society.

Both undergraduate and graduate students are engaged in leading-edge research at a world-class level either in an individual department or through interdisciplinary research centers and projects at the Graduate School of Engineering, through which they are able to acquire a necessary and sufficient ability to become active engineers and researchers, such as problem-solving ability, creativity, a global way of thinking, and communication and presentation skills.

At present, 1000 overseas students study at Kobe University; 270 of them are in either the Graduate School of Engineering or the Faculty of Engineering. Fostering human resources from a global point of view is one of the important missions of Kobe University and ours as well. The Faculty and the Graduate School offer an excellent research and educational environment and heartily welcome students from all over the world, especially those who wish to take on the challenge of exploring new corridors and fields in engineering.





History

Faculty of Engineering

The Faculty of Engineering was established in 1949, growing out of the former Kobe Technical College, which was originally established in 1921. Since then, it has contributed to the development of modern industrial society in the latter half of the 20th century through its education and research. The aim of the Faculty in the new millennium is to educate future researchers and engineers empowering them in contributing to the welfare of humankind through cutting-edge technologies.

The Faculty now has six departments: Architecture, Civil Engineering, Electrical and Electronic Engineering, Mechanical Engineering, Chemical Science and Engineering, and Computer Science and Systems Engineering, each of which consists of several divisions dedicated to the specific purposes of education and research. Approximately two-thirds of the students continue on to a Master's program.

Graduate School of Engineering

The Graduate School of Engineering was established in April 2007 as an educational and research institute aimed at providing engineering knowledge and fundamental and applied technologies directly related to the symbiosis and sustainable development of society, reorganizing the Graduate School of Science and Technology, which was established in 1981. It offers a consistent educational system from undergraduate to graduate school.
The Graduate School of Engineering offers the following five departments in both Master's and doctoral degree programs: Architecture, Civil Engineering, Electrical and Electronic Engineering, Mechanical Engineering, and Chemical Science and Engineering. By covering a wide range of interdisciplinary academic fields (environment, nanomaterial, information and telecommunication, life science, energy, robot, safety, etc.), these five departments are committed to delivering new technologies for the betterment of society.

Admissions Policy

Faculty of Engineering

With six courses of study in the Faculty of Engineering, we seek to nurture researchers and engineers who will open a path to the next generation. Students perform original and advanced work on the international stage, in addition to acquiring an understanding of the basic knowledge essential in each cutting-edge technological and scientific field. After graduation, the road for students to move forward to studies at the Graduate School of Engineering is wide open, allowing them to cultivate an even higher level of expertise and obtain the abilities needed for self-motivated research and development. Moreover, since students can choose to study abroad for a fixed period at overseas universities having partner relationships with the Faculty for education and research, we have created a system that enables students to gain an international perspective at the same time as they study in their chosen field of expertise. To ensure that students are able to comfortably understand basic and major concentration courses offered after admission to the faculty, the extent of their basic knowledge and thoroughness of understanding of different subjects are evaluated through the designated Center Examination and the individual examinations that serve as the faculty' s entrance requirements. The Faculty of Engineering at Kobe University cherishes people with lively curiosity, inquisitive minds, and a critical nature towards those things that cannot be understood merely by applying common sense, and we offer an environment where these traits can be taken full advantage of. The faculty welcomes all individuals who are full of the desire to contribute to the harmonious co-existence of the natural world and human society in the near future through scientific and technological fields.

Graduate School of Engineering

Although policies and standards for student admission differ depending on the homeland organization of the students wishing to enter the Graduate School and the major field welcoming the student, we have drawn up the following common guidelines for prospective students.

1) Applicants display enthusiasm for clarifying the principles behind natural phenomena, as well as for the application and development of technology, and have a strong desire to find problems on their own and attempt to resolve them.
2) Applicants are equipped with creativity and practical abilities.
3) Applicants have logical thinking abilities and persuasive power when presenting the results of research and in similar situations.
4) Applicants have ethical standards and the ability to understand and question the effects of technology on society.
5) Applicants have a clear awareness of their future direction (becoming researchers or professionals with a high level of expertise).
6) Applicants have a strong desire to acquire even higher-level and more advanced knowledge and technology among professionals who already have a great deal of practical experience.

International Activities at the Kobe University Graduate School of Engineering and Faculty of Engineering

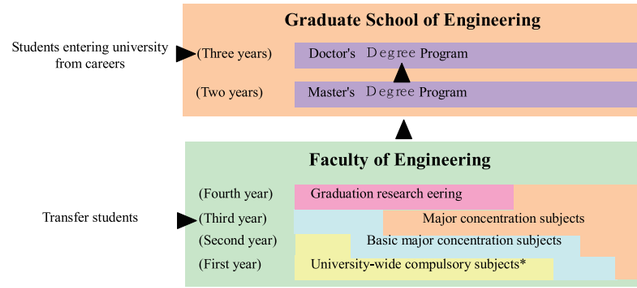
Kobe University has concluded several academic exchange agreements with other educational and research organizations at universities overseas, either between the universities themselves or between departments. We carry out joint research, exchanging teaching staff, students, and information in fields of mutual academic and educational concern. For student exchanges, we have put into place detailed agreements on the mutual non-collection of tuition and other fees, and students can go on exchange with the knowledge that the course credits they obtain at their overseas university will be accepted at their home university.

Based on these set programs, many students from the Graduate School and Faculty of Engineering study abroad at partner universities, under a credit transfer system. We also accept a number of exchange students from overseas to pursue their studies in the international atmosphere of the city of Kobe.

Studying

Faculty of Engineering

University students enrolled in the Faculty of Engineering are expected to obtain an extensive education and fundamental knowledge and be able to develop technology with an eye on the future of humanity. To this end, we believe our students, with their youthful, flexible intellects, need to be able to study freely and independently to become full-fledged members of society, while developing a feel for the advanced, high-level technology around them. While about 70% of Faculty of Engineering students go on to graduate school after completing the undergraduate program, graduates who leave us directly for the business world do not necessarily proceed in their own field of study, but rather advance in a wide variety of fields. Taking this into consideration, we have prepared a range of course subjects with the aim of training generalists in diverse fields. Along with strong grounding in the fields of the core curriculum, which is based on the central fields of engineering study, the Faculty of Engineering at Kobe University endeavors to instill in our engineers strong engineering ethical standards. After passing the graduate research examination in the fourth year, students are awarded a Bachelor' s degree.



*Principles of education, foreign language subjects, information basics, health and sports sciences

Graduate School

At graduate school, students first do the coursework part of the graduate program and then enter the dissertation-writing phase of the doctoral program. September 2007 saw the reorganization of the existing Graduate School of Science and Technology and its new incarnation. In addition to systematically developing a consistent educational program from the start of undergraduate studies until the completion of graduate work, the Graduate School of Engineering also looks to present a fundamental way of thinking for education and research that stresses original research into basic knowledge and the student' s specialization. The framework of the Graduate School of Engineering's educational program is a curriculum of engineering courses thoroughly covering the traditional areas of engineering scholarship, including a rich variety of programs (program course, multiple major course and cooperative education programs) to enhance the level of graduate school education.

Number of Faculties (As of May 1, 2014)

	Professors	Associate Professors	Assistant Professors	Research Associates	Total
Faculty of Engineering	53	56	26	5	140
Total of Kobe Univ.	563	519	237	22	1,341

Number of Students (As of May 1, 2014)

	Undergraduate Students				Graduate Students				Total
			Intl. Students				Intl. Students		
Faculty of Engineering	2,427	(315)	39	(11)	881	(108)	71	(28)	3,308
Total of Kobe Univ.	11,849	(4,044)	181	(100)	4,688	(1,509)	915	(537)	16,537

( ) : Number of female students

Degree program

Master's Degree Program

The Graduate School of Engineering's education and research is dedicated to cultivate human resources with a wide range of knowledge in their specialized field, and interdisciplinary perspectives. The school especially focuses on fostering researchers and highly specialized professionals who are rich in creativity, and possess multifaceted perspectives. Students are granted a Master's Degree in Engineering when they complete this program.

- Highly specialized main courses established through further development and deepening of the undergraduate engineering courses.
- Education in the area of integrated engineering with a number of advanced courses for interdisciplinary engineering education.
- Fostering of human resources educated through multi-major course (a major and several sub-majors).
- Medical Engineering Course for people who hold a full time job. (Master program to foster core human resources for manufacturing)

Doctor's Degree Program

Further developing and deepening of courses offered in the Master's Degree Program. This program is to foster researchers, academic members of higher education and research institutions, and highly specialized professionals who are highly creative, international-minded, and have an excellent ability to establish, explore, and solve problems by themselves. A Doctor's Degree, either a Dr. of Engineering or a PhD will be granted upon completion of the program.

- A strict coursework of research for dissertation.
- Finding problems, designing research plans, conducting research, organizing research results, finding possible ways to solve unsolved problems and then organizing and reporting these possibilities.
- Fostering of human resources educated through multi-major course (a major and several sub-majors)

Common-use facilities

-INTERNATIONAL STUDENT CENTER

The International Student Center is one of the university-wide research/teaching facilities established in April 1993. It provides international students with education in Japanese language and Japanese studies. It also offers consultations on problems encountered in studying or living in Japan. In its aim to promote international academic exchange programs, the Center supports overseas study for Japanese students studying at Kobe University. The local community is very important for the International Student Center; therefore, it actively promotes projects to strengthen ties between international students and local organizations, as well as programs to help international students improve their Japanese language abilities.
(http://www.kisc.kobe-u.ac.jp/english/i_topics.html)

-SCHOOL OF LANGUAGES AND COMMUNICATION

The School of Languages and Communication (SOLAC) was established in October 2003 in response to a call for more international communication at Kobe University. SOLAC aims to provide language-related support to the greater university community by introducing self-access rooms and CALL facilities for independent study, as well as developing more effective curricula, methodologies, and teaching materials for language courses. In addition, it plays an active role in promoting post-graduate research and education in the fields of language, culture, and communication.
(http://solac.cla.kobe-u.ac.jp/index-e.html)

-MEDICAL CENTER FOR STUDENT HEALTH

The Medical Center for Student Health was established in April 1970. Services provided by the Center include annual medical checkups for all students and staffs, as well as special checkups for X-ray and/or radioisotope users and new overseas students. Emergency medical treatment is also available. Doctors and nurses as well as counselors are available to provide consultation or advisory service on physical and mental health issues.
(http://www.health.kobe-u.ac.jp/)

Structure and Divisions

Faculty of Engineering /Graduate School of Engineering

Departments	Divisions	Education/Research Fields
Architecture Staff 29 (11 Professors / 11 Assoc.Professors)	**Spatial Design**	Architectural and Urban Design/ Housing and Community Design/ Structural Engineering and Design/ Building Management
	Architectural Planning, History and Theory	History and Theory of Architecture, Theory of Historical Environments/ Planning Theory of Built Environment/ Urban and Architectural Safety Planning
	Engineering of Building Structures	Structural Performance Engineering/ Structural Control in Dynamics/ Structural Systems Engineering
	Architectural Environmental Engineering	Planning of Acoustical and Lighting Environments/ Thermal Environmental Planning/ Planning of Urban Environment and M&E Services
	Cooperative Division	Disaster Mitigation Planning
Civil Engineering Staff 16 (8 Professors / 6 Assoc. Professors)	**Engineering of Human Safety**	Structural Engineering for Urban Safety/ Geotechnical Engineering for Urban Safety/ Transport Systems Engineering/ Geotechnical Engineering for Disaster Reduction/ Earthquake Disaster Mitigation Engineering/ Disaster-prevention Engineering for River Basin
	Engineering of Environmental Symbiosis	Environmental Fluid Engineering/ Engineering of Hydrospheric Environment/ Geo-environmental Engineering/ Urban Preservation Engineering/ Urban Preservation Engineering/ Urban and Transport Planning and Management
Electrical and Electronic Engineering Staff 28 (10 Professors / 12 Assoc. Professors)	**Physical Electronics**	Mesoscopic Materials/ Photonic Materials/ Quantum Functional Engineering/ Nano-Structure Electronics/ Electromagnetic Energy Physics
	Computer and Information	Integrated Circuit Information/ Computer Engineering/ Information and Communication Engineering/ Algorithms/ Intelligent Learning Theory
	Cooperative Division	Functional Thin-Film Engineering
Mechanical Engineering Staff 34 (12 Professors / 15 Assoc. Professors)	**Thermo-Fluid and Energy**	Applied Fluid Engineering/ Multiphase Thermo-fluid Dynamics/ Energy Conversion Engineering/ Energy and Environmental Engineering
	Mechanics and Physics of Materials	Solid Mechanics/ Fracture Control Engineering / Material Science/ Surface, Interface and Tribology
	Design and Manufacturing	Complex Mechanical Engineering/ Machine Dynamics/ Computer Integrated Manufacturing/ Intelligent Artifacts and Manufacturing Systems/ Creative Design
	Cooperative Divisions	Intelligent Production Systems/ Adaptive Function Model
Chemical Science and Engineering Staff 32 (12 Professors / 12 Assoc. Professors)	**Applied Chemistry**	Organic Reactions/ Inorganic Materials Chemistry/ Synthetic Organic Chemistry/ Soft Matter Interface/ Smart Polymer Chemistry/ Material Physical Chemistry/ Tailor-made Materials Chemistry/ Functional Analytical Chemistry/ Biofunctional Materials Chemistry
	Chemical Engineering	Membrane Engineering/ Catalysis and Catalytic Reaction Engineering/ Material surface Engineering/ Transport Science and Engineering/ Fluid and Particle Engineering/ Drying Process Engineering/ High-pressure Fluid Property and Application Technology/ Bioproduction Engineering/ Bioprocess Engineering
	Endowed Division	Sustainable Chemistry
	Cooperative Division	Localized Reactions and Physical Properties of Materials/ Chemical Energy Conversion Process/ Biofunctional Engineering/ Pharmaceutical Design and Production Engineering/ Chemical Biosensing
***Computer Science and Systems Engineering** Staff 43 (20 Professors / 13 Assoc. Professors)	**Informatics**	Media Informatics/ Programming Languages/ Intelligent Systems/ Artificial Intelligence/ Intelligent Software/ Intelligent Software/ Mathematics of Informatics
	Information Systems	Intelligent Robotics/ Wireless Telecommunication/ Information Photonics/ Computer System/ Processor Architecture
	Systems Design	Systems Planning/ Optimum System Design/ System Control/ System Informatics/ System Structure Analysis/ Identification Theory for Distributed Parameter Systems and Applied Functional Analysis/ Control of Distributed Parameter Systems and Nonlinear Analysis
	Cooperative Divisions	Applied Systems/ Kansei and Media Art

*With respect to this department, a new Graduate School of System Informatics is established in 2010 with three departments in both the Master's and Doctor's Degree Programs.

ARCHITECTURE

SYMBIOSIS OF ARCHITECTURE AND ENVIRONMENT, CREATION OF SAFE AND COMFORTABLE LIVING SPACE

http://www.arch.kobe-u.ac.jp

Exercise in architectural design and planning at the studio

Practical design and fabrication of Wood Trusscs. Students verified the strength using their own weight.

Presentation of design projects

Measurement of the thermal environment

Exercise in drawing and painting

Listening test in an anechoic room

PHILOSOPHY OF THE DEPARTMENT

Architecture is an eminently universal field of learning, concerning the creation of housing and architectural facilities as necessary components of human life. In order to respond to both universal and up-to-date architectural problems, it is necessary not only to study basic fields of architecture (design and planning, structural engineering, environmental engineering) but also to synthesize them for spatial and temporal design problems. The Department Architecture, Kobe University, aims to produce talented professionals who can correspond synthetically to contemporary architectural challenges, by providing education with both specialization and synthesis.

CONTENT OF THE EDUCATION

The undergraduate program starts with liberal arts and basic subjects on natural and information science, followed by basic and applied subjects of architecture extending over design and planning, structural engineering, and environmental engineering, and continues to synthetic and practical spatial design education.
The Master's program aims at the acquirement of higher knowledge of design and planning, structural engineering, and environmental engineering, while And at the same time training for deducing specific answers to spatial and temporal design problems.
The doctoral program aims at the construction and cultivation of theory associated with design and planning, structural engineering, and environmental engineering to produce international talent with sophisticated special knowledge.

STRUCTURE AND DIVISIONS

-SPATIAL DESIGN DIVISION

Synthetic and practical education and research on the creation of space:
Architectural and Urban Design, Housing and Community Design, Structural Engineering and Design Building Management

-ENGINEERING OF BUILDING STRUCTURES DIVISION

Education and research for the safety of buildings in the case of earthquakes, improvement of building materials and structural systems:
Structural Performance Engineering, Structural Control in Dynamics, Structural Systems Engineering

-ARCHITECTURAL PLANNING, HISTORY AND THEORY DIVISION

Basic education and research on architectural design:
History and Theory of Architecture, Theory of Historical Environments, Planning Theory of Built Environment, Urban and Architectural Safety Planning

-ARCHITECTURAL ENVIRONMENTAL ENGINEERING DIVISION

Education and research on analysis, control, and planning of architectural and urban environments:
Planning of Acoustical and Lighting Environments, Thermal Environmental Planning, Planning of Urban Environment and M & E Services

MESSAGES FROM FOREIGN STUDENTS STUDYING IN THE DEPARTMENT

ABDUL MUNIR [from Indonesia]

It is a great educational experience for me to be a graduate student at Kobe University, which has very well organized academic activities and very good official services. I enjoy the academic atmosphere on campus as well as the daily life in Japan, which is a beautiful country with generous and friendly people and rich cultural values. Thanks to Kobe University for this opportunity.

FARAMARZ RAHIMINIA [from Iran]

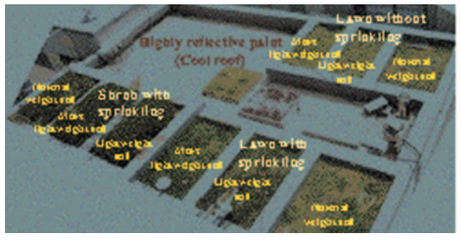
I had always dreamed of continuing my education in Japan, which is a leader in the field of earthquake resisting structures. It is a very valuable experience for me to be involved as a Ph.D. candidate in the steel structure laboratory in the architectural department of Kobe University. I enjoy living in Japan with my family while developing my skills in the academic field.

MIAO DA FU [from Indonesia]

I was interested in architecture before coming to Japan. I applied to the Department of Architecture at Kobe University, which has a long history and has produced many talented professionals. When I entered, I sometimes became nervous. However, I have had a happy school life thanks to friendly Japanese students and kind teachers and staff. In the specialized subjects, I learned new knowledge, and It was very stimulating. I'll never forget how pleased I was when I designed my first architectural presentation with my ideas. At the same time, the experiments and simulations shown in the classes on structural and environmental engineering were very interesting. After I joined a laboratory in my fourth year, I took part in many seminars, discussions, and investigations, and deepened my academic interests. Of course, there is more than studying. Kobe University has many chances for interacting with foreign students. I've made many friends. This is a very nurturing environment to expand one's perspective through touching other cultures. My four years in Kobe were incredible. I entered the Master's course at Kobe University to increase my technical knowledge. Interesting classes, charming professors, and above all, fun architecture that can shape your dreams ... Won't you realize your dreams in the Department of Architecture at Kobe University?

RESEARCH TOPIC

Experiment on semi-rigid composite connection
(Study on composite structures by Assoc. Prof. Ohtani)



Experimental roof for surface cover technology in an urban structure at Kobe University
(Study on urban thermal environment by Assoc. Prof. Takebayashi)

Temporary housing model made of bamboo and plaster in a disaster area of the Central Java Earthquake
(Study on reconstruction processes by the Environmental Planning & Design Lab)

Civil Engineering

NEW CIVIL ENGINEERING TOWARDS SAFETY AND SYMBIOSIS OF URBAN AND REGIONAL SYSTEMS

http://www.shimin.eng.kobe-u.ac.jp

Philosophy

Civil Engineering aims at creating a safe society in harmony with the environment, through the construction and preservation of infrastructure. Civil engineering education help us create urban and regional environments safe from natural and social disasters, and live in symbiosis with nature, through preservation, lifetime management and revival of city facilities. We admit students who are ambitious to become the pillars of public service needed in our society, and we develop them into individuals with broad academic backgrounds, specialized knowledge, and high-level practical skills.

Educational Content

Solving safety and environmental problems in urban and regional areas is a common interest worldwide. "New civil engineering in the 21st century" focuses on various new engineering aspects while maintaing a well-built and established base of civil engineering. The program also emphasizes public participation and international cooperation.
Courses offered to undergraduate, master's and doctoral students give them deep knowledge and understanding of the safety and environmental aspects of modern society. The study area covers a wide range in the fields of disaster prevention and mitigation, environmental assessment and protection, infrastructure planning and management, and geotechnical and structural designs. Students who aspire to make their career in public services at global or local levels are welcome. Currently, we have more than 10 overseas students from China, Korea, India, and other countries.

Constitution

Civil engineering is a diverse academic field that has supported civil society ever since Roman times. In the core of the curriculum are the civil engineering subjects, complemented by subjects dealing with environmental considerations, the status quo of public facilities reflecting public opinion, as well as the internationalization of design codes and standards.
The Department of Civil Engineering consists of the Human Safety and Security Engineering section and the Environmental Symbiosis Engineering section. The Human Safety and Security Engineering section does teaching and research about urban safety against natural disasters and social disasters such as terrorism and accidents. The Environmental Symbiosis Engineering section engages in teaching and research about the creation of urban and regional environment living in symbiosis with nature, as well as the preservation, lifetime management, and renewal of city facilities.

Role of Public Service

1) Safety and security: Save us from natural disasters such as earthquakes and floods and provide safe and secure living environment.
2) Natural symbiosis: Improve infrastructure symphonic with natural environment and pass on a good global environment to future generations.
3) Community collaboration: Create urban and regional space with great individuality, involving publ ic comments.
4) International cooperation: Support the development of overseas societies with infrastructure improvement and disaster relief.

Messages from an Overseas Student

Mauro Ricardo Simão [Doctoral student from Mozambique, 2014-2017]

First and foremost, allow me to greet and wish a warm welcome to all those students who have selected and been accepted to Kobe University. You are in for a life changing experience. Kobe University is an exciting and challenging environment to study in, whether for a degree or research purposes. This is specially the case in the Faculty of Engineering/Graduate School of Engineering where I belong. In my department, research and lectures are conducted in both Japanese and English, making the multilingual environment much richer. I am sure that one of the biggest concerns prospective students have before applying to study in Japan is not having prior knowledge of Japanese certainly, that was my case. But let me assure you that there is a whole support structure that has been created to accommodate students, especially while they focus on learning the language in the many available language programs at Kobe University. Furthermore, by studying at this great university, one has the opportunity to live in the city of Kobe. It is a very multi-cultural and vibrant city filled with great sight-seeing spots. Kobe is, in my opinion, one of the most interesting cities in Japan to live in, with its mixture of old and new, culture and history, people and places. With that, it is my privilege to welcome you to the city of Kobe, Kobe University, and wish you a great time.

Rresearch Topic(earthquake disaster mitigation engineering)

The engineering community has long worked to build safe and reliable lifeline systems, that is, those systems necessary to provide electric power, natural gas, water and wastewater, and transportation facilities and services that are essential to the well being of the community they seek to serve. Providing lifeline system function is especially important in assisting rapid recovery following natural hazards. Engineering approaches to limiting damage to lifeline systems from natural hazards have developed specifically for individual natural hazards and individual types of lifeline systems.
The Division of Earthquake Disaster Mitigation Engineering has contributed to identifying lifeline system risks and implementing measures to improve earthquake performance of the systems. In this regard, several activities are carried out as follows: field surveys on seismic damage to lifeline systems during each earthquake; elaboration and verification of underground conduit analysis; development of models and methods for reliability analysis of large networks and systems for business interruption analysis; emphasis on measures for lifesaving systems; and implementation of an overall seismic mitigation evaluation considering disaster prevention investment in community, economy, and social activity according to the function damage of lifelines.

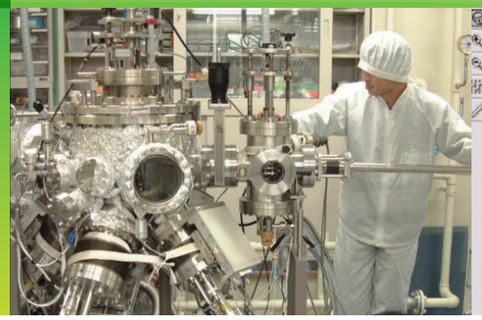
Field surveys on lifeline damages

Seismic mitigation prioritization in lifeline systems

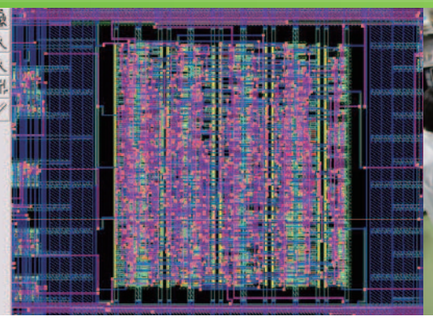
Electrical and Electronic Engineering

HARDWARE AND SOFTWARE ENGINEERS/RESEARCHERS FOR A HIGH INFORMATION SOCIETY

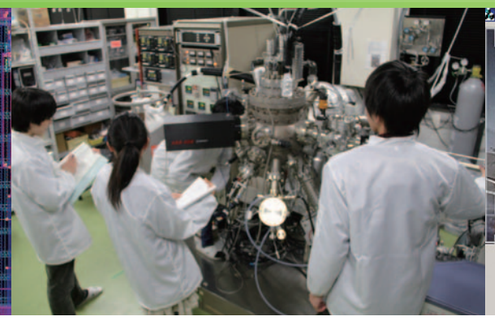
http://www.eedept.kobe-u.ac.jp



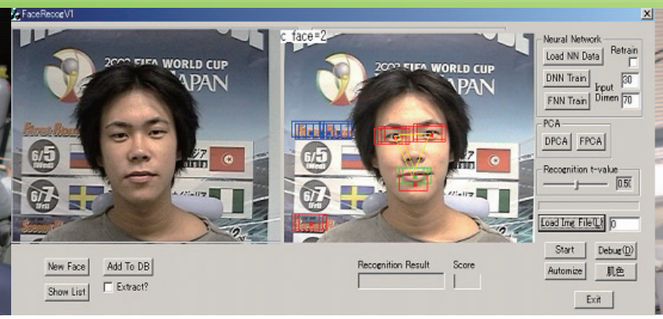
Sputter deposition system



LSI layout design of CAD system



Experimental arrangement for new materials



Face recognition system

Multi-slot antenna and microwave plasma generator

Concept

In recent years, electrical and electronic engineering/technology has been expanding with the rapid advancement in all engineering disciplines, which inherently embrace an ever-widening range of academic and professional programs. From a global point of view, the Department of Electrical and Electronic Engineering offers the balanced interdisciplinary core subjects and studies on both education and research in the state-of-the-art scientific and technological fields of Physical Electronics, Computer and Information Engineering, and Functional Thin-Film Engineering.

Education

The characterized and professionalized education and research core courses in the Department of Electrical and Electronic Engineering are specifically classified into two balanced academic divisions Physical Electronics and Computer and Information Engineering. The Division of Physical Electronics offers scientific and technological education as well as interdisciplinary and frontier research project works, which are mainly concerned with the sectionalized major education and research programs. The Division of Computer and Information offers scientific and technological education as well as sophisticated hardware and software research project works associated with the sectionalized education and research programs.

Structure

The Physical Electronics Division covers specialized education and sectionalized research on electromagnetic field and waves, solid-state physical engineering, quantum physics and electronics, electrical and electronic material science, semiconductor electronics, sensor devices, nanoelectronics, photonic devices, surface physics and electronics, super-conducting physics and electronics, optics and optoelectronics, high-energy physics, plasma electronics, and bio-science and engineering in addition to such fundamentals as applied mathematics, physics, chemistry and mechanics. The Computer and Information Engineering Division includes specialized education and sectionalized research on electric and electronic circuit theory, integrated circuit design and systems, computer and communication systems, wearable computing, ubiquitous and ad-hoc networks, information networks, information transmission, information theory, coding theory, data compression, digital broadcasting, information and network security, data structures and algorithms, graph theory, software design, image processing, control engineering, optimization theory, pattern recognition, fuzzy theory and neural networks, and intelligent machines.

International Program

According to the academic exchange agreements with overseas universities and institutions, our department conducts intensive exchanges for education and research. Every year, foreign students from Korea, Malaysia, etc. enrich the academic and international environment on campus. Some labs cooperate with research institutions of the USA, Germany, New Zealand, Korea, England, France, etc.

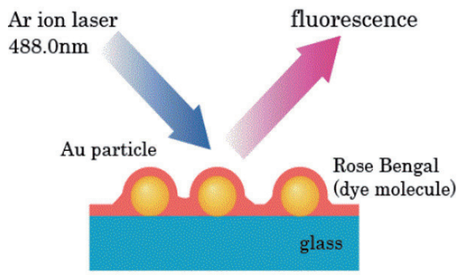
Message from an International Student

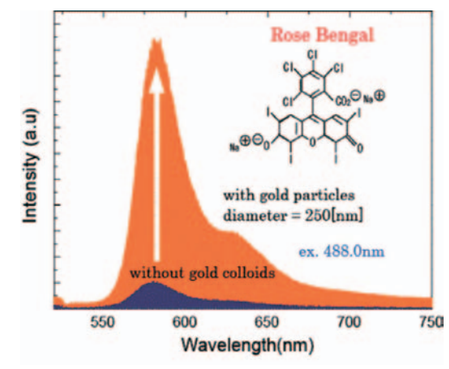
Fadiah Adlina Binti M.Ghazali [from Malaysia]

It has been a great opportunity to earn my Bachelor's and Master's degree at Kobe University with the guidance and help of dedicated and highly acclaimed professors in the material mesoscopic laboratory and EE department. Pursuing my research here in plasmonics has given me the chance to use high-tech laboratory facilities and attend international conferences, which has definitely expanded my horizon at so many levels. It is a wonderful experience to mix with Japanese students and learn the language and interesting culture. Kobe University has by far the most beautiful location beneath Mt.Rokko and seaview of the port of Kobe. Kobe has many foreigners and is not too crowded. I think Kobe is one of the best cities in Japan to live in.

Research Topic: Development of Plasmonics
(Division of Physical Electronics, Mesoscopic Materials Laboratory)

The beautiful colors of glass ornaments and stained glass in churches are generated by metallic fine particles embedded in the glass. Such coloring phenomena are due to the absorption of light by the collective oscillation of free electrons in the fine particles, called surface plasmons. When metallic nanostructures are illuminated, surface plasmons are excited and giant electromagnetic fields are induced in the vicinity of the surface. Plasmonics utilizes such giant electromagnetic fields to realize high-performance optical devices including various sensors. In our laboratory, we study the enhancement of light emission from semiconductor nanocrystals and dye molecules in the presence of metallic nanostructures. The figures show the enhancement of photoluminescence from Rose Bengal molecules caused by gold particles.





Mechanical Engineering

THE CHALLENGE OF MONOZUKURI INNOVATION

http://www.mech.kobe-u.ac.jp/

Concept

Mechanical engineering has been progressing as a basic discipline contributing to modernization and economic development for more than two centuries, ever since the industrial revolution. The development of machinery industry based on mass production/consumption, however, causes global environmental problems, such as global warming and deficiency of natural resources. Mechanical engineering is now required to solve these problems by developing technologies for CO2 reduction, energy saving, and alternate recourses and must aim at “sustainable manufacturing (MONOZUKURI)”, assuming recycle/reuse and aging societies. To cover such diverse target domains, our department will not stay in the conventional mechanical engineering domains but make a continuous challenge towards “MONOZUKURI Innovation” by collaborating with various areas including biology, medicine, welfare, electric and electronics technology, and information and communication technology.

Education

Our educational goal is to train students to become an engineers who can solve even newly faced problems by taking the initiative and cooperating with others. For this purpose, the curriculum is planned to start from basic aspects and proceed to advanced applications. Our educational programs cover lectures on basic engineering, workshop practices, design seminars and advanced courses in engineering. Lectures in various specialized research fields are also given. In the fourth year, students work on their graduation theses under the guidance of faculty. Currently, over 70 % of undergraduate students proceed to the graduate school to continue their studies.

Structure and Divisions

The department of Mechanical Engineering was established in 1921, one of the oldest departments in the University. It produces many leading engineers in mechanical engineering. The department has three divisions: Thermo-fluid and Energy, Mechanics and Physics of Materials, and Design and Manufacturing. Research programs are offered in 13 fields.

-DIVISION OF THERMO-FLUID AND ENERGY

Towards effective use of energy and bettering the environment, education and research are conducted from both elemental and system perspectives. Reliable thermo-fluid-energy machineries and highly efficient energy conversion systems are being developed by theoretically, experimentally, and numerically investigating complex mechanisms governing thermo-fluid phenomena.

-DIVISION OF MECHANICS AND PHYSICS OF MATERIALS

The mission of this division is to promote research and education through multi-scaled analyses and experimental evaluation of structures and machine components; characterizations of mechanical, physical, and chemical properties of materials; and formations of advanced materials by designing specific features of surfaces and of "solid mechanics," "fracture control engineering," "materials science," and "surface, interface, and tribology."

-DIVISION OF DESIGN AND MANUFACTURING

The mission of this division is to establish engineering solutions required for developing active but sustainable next generation social systems from the viewpoints of design, manufacturing, operation, and reuse/recycle of artifacts. Towards this goal, we conduct education and research on system analysis and design, intelligent robots, control theory, emergent systems, and next-generation manufacturing technologies that cover a wide range of phenomena at micro and macro levels, such as machine elements, mechanical systems, and social systems.

Message from an International Student

Coi Ji Sun 【Undergraduate student from Korea】

Studying at Kobe University has brought me wonderful memories. I chose to study at Kobe University because of its internationality, and it turned out to be the right choice. My teachers and friends are very kind, so I can study with peace of mind. There are tutors who support international students in their studies. When I was a freshman, the tutors were very helpful to me.

Kobe University has many social groups and clubs. I enjoyed my participation in the glider club and met many people whom I value very much. Here is a place where I can realize my dream. Now I’m in my fourth year and doing research activities freely. I hope to continue on to the Master's program for higher education in this wonderful place.

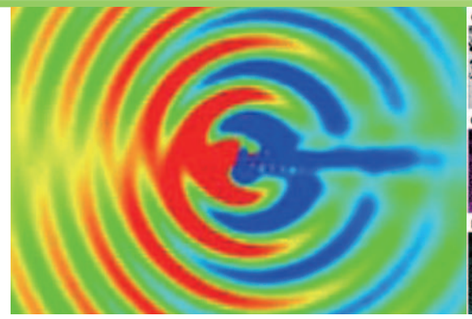


Fig. 1 Applied Fluid Engineering

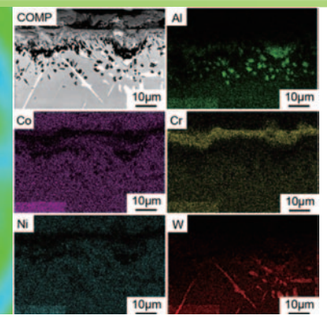


Fig. 2 Composition mapping of high-temperature materials

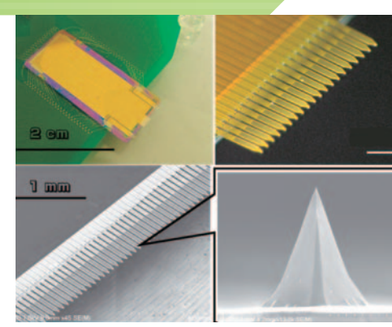


Fig. 3 Intelligent Artifacts and Manufacturing Systems

Research Topics

-DIVISION OF THERMO-FLUID AND ENERGY

Figure 1 shows the Aeolian tone generated from a cylinder placed in a uniform flow. The detailed structure of the sound wave is clarified by direct numerical simulations of the unsteady motion of fluids using the Lattice Boltzmann method.

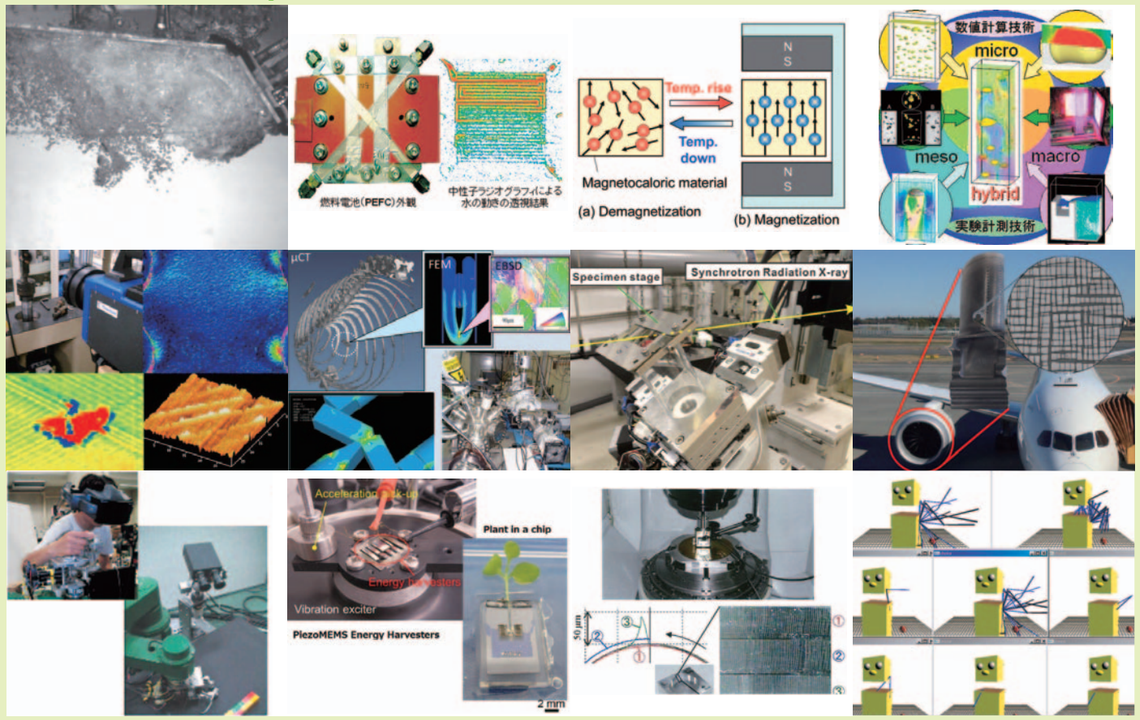
-DIVISION OF MECHANICS AND PHYSICS OF MATERIALS:

Figure 2 shows an example of the chemical analysis of oxidized high temperature structural material. When materials are oxidized at high temperatures, a heterogeneous distribution of constituent elements occur in addition to the formation of a oxide film. Materials having superior mechanical properties and oxidation resistance lead aircraft engines and electric generator to have higher efficiencies.

-DIVISION OF DESIGN AND MANUFACTURING:

Figure 3 shows a mul t iprobe cant i lever ar ray independently driven by MEMS thermal actuators for a new parallel nanolithography system. This device allows creating patterns on main-chain-decomposition-type EB resist film, and nanopatterns with a minimum line width of 50 nm were successfully formed in air.

Other research topics



Chemical Science and Engineer ing

HELPING THE DREAMS OF THE 21ST CENTURY COME TRUE

http://www.cx.kobe-u.ac.jp/index_j.html

Concept

The overall mission of the Department of Chemical Science and Engineering is to foster the next generation of researchers and engineers in chemistry-related fields on a global scale by education and research to meet the needs of industry and society in general. The research and educational activities in our department cover the fields of fundamental chemical science on the microscopic and molecular level, the addition of specific functionality to chemicals and materials, engineering applications of biofunctional materials, and process development in industrial scale material production.

Education

In recent years, significant technological developments and innovations have resulted in rapid and marked changes in the way highly functionalized chemicals and materials are produced, as well as in the chemicals/materials themselves. Thus, it is essential for the future chemical researcher not only to have a sound fundamental knowledge of chemistry, physics, and biology from an engineering viewpoint, but also to have the skills and ability to apply this knowledge with respect to a wide range of chemical products and processes, to be able to analyze and synthesize chemicals, and to design environmentally friendly chemical and biochemical systems. In this vein, the department's mission is to provide students with the skills required to satisfy the needs of the chemical industry and society in general as chemical researchers and engineers, with an emphasis on fundamental science, analysis, applications, and creativity.

Organization

Our department consists of two divisions: The Division of Applied Chemistry and the Division of Chemical Engineering. Research/education within the Division of Applied Chemistry includes the generation of functionality of chemicals and materials and elucidation of mechanisms involved, as well as the development of techniques for new material production from atomic/molecular levels to nano/meso/macro levels to attain a wide range of functionality on a macroscopic level by the accumulation of molecules into novel materials. Research/education in the Division of Chemical Engineering includes the development of useful materials and reaction catalysis, establishment of controlled processes involving reaction and mass transfer and development of new production processes based on the clarification of interaction between molecules, functionality of biomaterials and energy and mass transport phenomena. The ultimate goal is the development of new production processes with both high efficiency of material and energy and low environmental impact.

Division of Applied Chemistry

CREATIVE MATERIALS CHEMISTRY

Research Group	Keywords
Organic Reactions	Transition metal catalysis, Polymer syntheses, Advanved organic materials
Inorganic Materials Chemistry	Inorganic materials, Electrochemistry, Materials for energy conversion, Highly concentrated solution, Molten salt chemistry, Liquid phase deposition, Relaxative auto-dispersion, Solid-liquid coexisting systems, Hetero-phase effect, Nanomaterials
Synthetic Organic Chemistry	Heterocyclic chemistry, Fluorine chemistry, Biologically active substances, Functional materials, Exploratory research on medicines and agrochemicals
Soft Matter Interface	Polymer synthesis, Soft matter, Polymer particles, Interface, Heterogeneous polymerization

SMART MATERIALS CHEMISTRY

Research Group	Keywords
Smart Polymer Chemistry	Polymer property, Polymer structure, Polymer surface and interface, Composite, Adhesion
Material Physical Chemistry	Organic thin films, Control of molecular orientation and structure, Organic devices, Evaluation of optical and electronic properties, Molecular nanotechnology

FUNCTIONAL MATERIALS CHEMISTRY

Research Group	Keywords
Tailor-made Materials Chemistry	Molecular recognition, Functional gel, Polymer particles, Molecular imprinting, Biosensors
Functional Analytical Chemistry	Inorganic polymer chemistry, Inorganic phosphates, Inorganic energy chemistry, Environmental analytical chemistry
Biofunctional Materials Chemistry	Biofunctional materials, Drug delivery system, Cell/tissue engineering, Biomaterials

Division of Chemical Engineering

SEPARATION AND REACTION ENGINEERING

Research Group	Keywords
Membrane Engineering	Membrane separation, Separation based on reaction and diffusion, Control of microporous structure, Water treatment, Gas separation
Catalysis and Catalytic Reaction Engineering	Catalyst, Catalytic reaction engineering, Selective oxidation, Selective reduction, Surface science, Material science, Photocatalyst, Photocatalysis, Energy conversion, Green chemistry
Material-surface Engineering	Interface, Surface functionalization, Surfactant, Polymer, Biomolecule

PROCESS ENGINEERING

Research Group	Keywords
Transport Science and Engineering	Process intensification, Process dynamics, Reactor
Fluid and Particle Engineering	Rheology, Complex fluid, Latent heat transportation, Functional film, Drag reduction
Drying Process Engineering	Coating drying, Drying model, Material-temperature change method, Microwave drying
High-pressure Fluid Property and Application Technology	High pressure, Fluid property, Pressure crystallization, Refrigerants

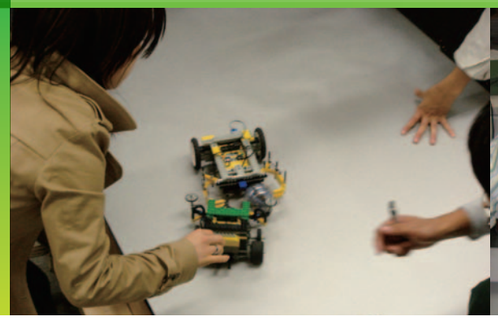
BIOCHEMICAL ENGINEERING

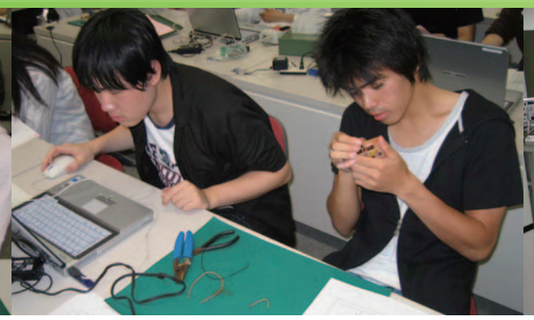
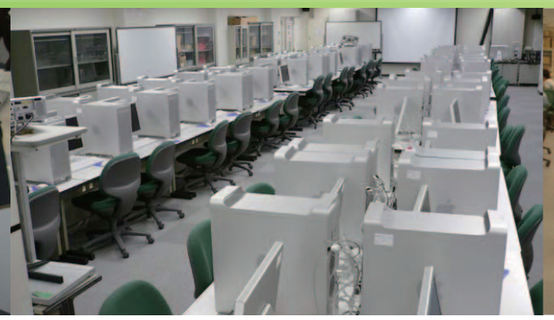
Research Group	Keywords
Bioproduction Engineering	Bioproduction, Biorefinery, Synthetic bioengineering, Protein engineering, Nanobio technology
Bioprocess Engineering	Bioprocess, Bioreactor, Cell culture engineering, Recombinant protein production, Bioseparation

Computer Science and Systems Engineering

REALIZATION OF INTELLECTUALIZED NOVEL INFORMATION SYSTEMS TOWARD AN ACTUALIZATION OF CREATIVE PROCESSES

http://www.csi.kobe-u.ac.jp/cs/site/




Computer and Systems Laboratory and Practice

Concept

The Department of Computer Science and Systems Engineering is devoted to such themes as the "pursuit of creative process through intelligence" and "creation of the next generation of intellectualized information systems." The department aims at one of the newest academic disciplines by integrating not only the fields of computer science and information technology, but also various scientific and engineering fields including electronics, mechanical engineering, life science, social science, and so on. The multi-disciplinary nature of computer science and systems engineering offers an exciting challenge for students thinking of embarking on a career in almost any scientific and engineering field or information technology field in an advanced and more computerized society.

Education

The course structure aims at the wide and deep exploration of education and research relating to computer science and systems engineering. The undergraduate program structure is department's carefully designed for students to study multi-disciplinary major courses as well as liberal arts. Freshman students start fundamental courses of computer science and systems engineering, such as mathematics, physics, logic circuits, and computer engineering. Sophomore students study both the fundamental and advanced courses including programming languages, spectrum analysis, and system analysis. junior students mainly take advanced classes such as database systems, sensing technology, and robotics. All senior students are engaged in research projects. Four-year Bachelor's degrees are awarded to undergraduate students. With respect to this department, a new Graduate School of System Informatics was established in 2010 with three departments. Master's and doctoral degrees are awarded to students who have successfully completed the required subjects of an authorized graduate program. We have accepted many foreign students and young researchers from more than 20 countries around the world.

Message from an International Student

Yi Qian [Doctoral Course]

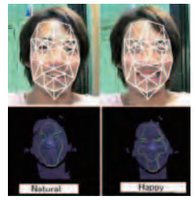
My name is Yi Qian, and I am from China. I came to Kobe University in 2006 to study in the Master's course for systems planning. Now, I am working hard in the doctoral course because I am very attracted to my research on real/virtual manufacturing systems. It has been a wonderful experience to study at Kobe University, where I could improve my knowledge in my area of research. At the same time, I had the chance to study the Japanese language and to learn about Japanese culture. In particularly, I admire the convenience in daily life. You can find convenience stores and vending machines everywhere in streets, and the complex train will could also punctually take you to anywhere you want to go. Kobe is one of the most beautiful cities in Japan, and the life here is really interesting Every day is a new opportunity and a new challenge to learn something different. I firmly believe my experience here will help me a lot in my future in terms of my personal and professional life.

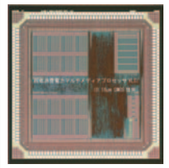
Structure and Divisions

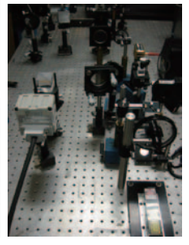
-THE DIVISION OF INFORMATICS

The Division of Informatics is responsible for education and research on computer science, information processing, and applied informatics. The current research activities cover a wide range of subjects, including information media, programming language, intelligent systems, artificial intelligence, intelligent software, mathematical information science, and art media engineering.





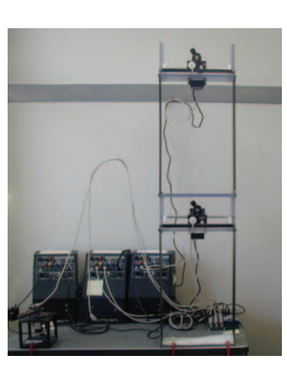
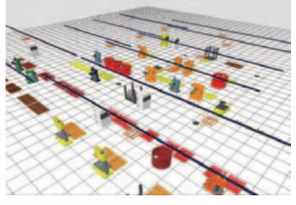


-THE DIVISION OF INFORMATION SYSTEMS

The Division of Information Systems is responsible for education and research on core technologies for advanced information processing and intellectualized information systems. The research projects cover a wide range of subjects, including intelligent robotics, wireless communication, information photonics, computer systems, and processor architecture.

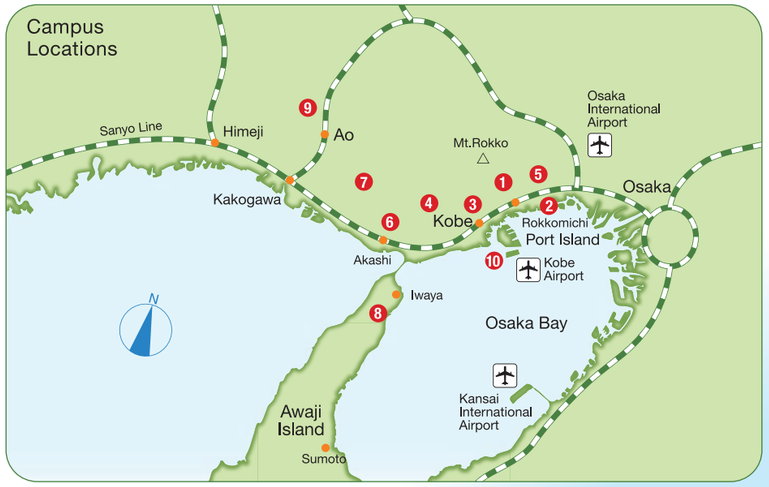
-THE DIVISION OF SYSTEM DESIGN

The Division of Systems Design is for education and research on the analysis and synthesis of intelligent systems and problem-solving processes. The research projects focus on various issues, including systems planning, systems design, control systems theory, systems informatics, systems structure, mathematics of systems, and advanced mechatronics.


*Information about the Graduate of System Informatics can be found on the following homepage: http://www.csi.kobe-u.ac.jp

Access



1. Rokkodai Campus
2. Fukae Campus
3. Kusunoki Campus
4. Myodani Campus
5. Sumiyoshi Elementary School, Sumiyoshi Junior High School
6. Akashi Elementary School, Akashi Junior High School, Kindergarten
7. School for Special Needs Education
8. Research Center for Inland Seas
9. Food Resources Education and Research Center
10. International Residence Business Incubation Center Kobe Biotechnology Research and Human Resource Development Center

Kobe City

The City of Kobe is located to the west and center on the main island of Japan. It is accessible by land, sea, and air to domestic and international locations. It takes 2 hours and 50 minutes to get to Tokyo by Shinkansen Bullet Train, and 1 hour and 20 minutes by plane. Within easy reach of Kobe, there are several famous cities with many historical sites and spots of interest, such as Himeji, Kyoto, Nara, and Osaka.

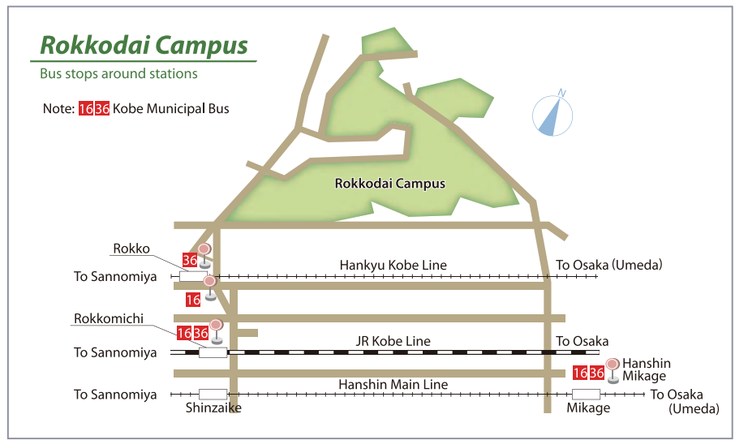
Ever since it was opened to the world, Kobe has developed as a cosmopolitan port city where people, goods, and information from around the globe are in constant motion. Now, Kobe has a population of 1.5 million including 45,000 foreign residents from as many as 115 different countries and is well known throughout Japan as being an “international city.” With a diverse population of foreign residents and the resulting facilities and amenities established by and for such foreign communities, Kobe is uniquely qualified to support a comfortably refined lifestyle for any individual from any country.

Sandwiched between Mt. Rokko in the north and the Inland Sea of Seto in the south, Kobe is endowed with an overall mild climate averaging 17.1C (62.8F) with four seasonal changes.

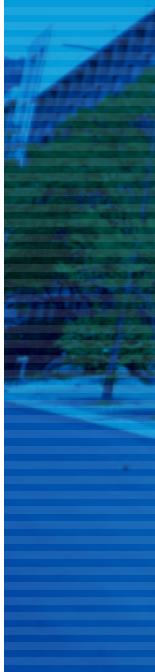
Rokkodai Campus

1-1 Rokkodai-cho, Nada-ku,
Kobe 657-8501 Japan

1. Main Building (Graduate School of Economics / Faculty of Economics Graduate School of Business Administration / School of Business Administration)
2. IDEMITSU SAZO Memorial Rokkodai Auditorium
3. Graduate School of Law / Faculty of Law
4. Library of Social Sciences
5. Research Institute for Economics and Business Administration
6. Graduate School of International Cooperation Studies
7. Student's Hall
8. Academic Hall of Social Sciences
9. Frontier Hall of Social Sciences (EU Institute in Japan, Kansai)
10. Graduate School of Human Development and Environment / Faculty of Human Development (Institute of Human Development Support)
    Library of Human Development Sciences
11. Graduate School of Intercultural Studies / Faculty of Intercultural Studies
    General Library / Library of Cross-Cultural Studies
12. Institute for the Promotion of Higher Education
13. School of Languages and Communication
14. Student Center
15. Gymnasium
16. Graduate School of Engineering / Faculty of Engineering
17. Graduate School of System Informatics
18. Graduate School of Science / Faculty of Science
19. Graduate School of Agricultural Science / Faculty of Agriculture
20. Library of Science and Technology
21. Science and Technology Research Building 1 (Organization of Advanced Science and Technology)
22. Science and Technology Research Building 2
23. Science and Technology Research Building 3
24. Science and Technology Research Building 4
25. Research Center for Environmental Genomics
    Biosignal Research Center
26. Research Center for Urban Safety and Security
27. Graduate School of Humanities / Faculty of Letters
    Library for Humanities
28. Administration Offices (Secretariat / Medical Center for Student Health)
29. Information Science and Technology Center (Main)
30. Information Science and Technology Center (Annex)
31. Office of Collaborative Research and Technology Development
32. Office of Collaborative Research and Technology Development (Venture Business Laboratory)
33. Center for Supports for Research and Education Activities, Radioisotope Division
34. Center for Supports for Research and Education Activities, Cryogenic Division
35. Center for Supports for Research and Education Activities, Instrumental Analysis Division
36. Center for Environmental Management
37. Kobe University Centennial Hall (Rokko Hall / International Student Center)
38. Yamaguchi Seishi Memorial House
39. Takikawa Memorial Hall
40. Chobo-kan (Guest House)



KOBE
UNIVERSITY



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